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ASTRONOMICAL

AND

METEOROLOGICAL OBSERVATIO

MADE DURING

THE YEAR 1877,

AT THE

UNITED STATES NAVAL OBSERVATORY.

REAR-ADMIRAL JOHN RODGERS, U. S. N.,
SUPERINTENDENT.

PUBLISHED BY AUTHORITY OF THE
HON. SECRETARY OF THE NAVY.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1881.

5-41

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ERRATA.

WASHINGTON OBSERVATIONS FOR 1876.

Page XLII, line 9, for Table X read Table XI.
Page 38, Appendix III, formula (9), read $0 = -n - A \sin \frac{1}{2}\omega - B \cos \frac{1}{2}\omega + C$.

WASHINGTON OBSERVATIONS FOR 1877.

Page 20, O. Arg. S. 5144, Inst. Corr., for 6′ 57″.69 read 4′ 0″.59.
Page 20, O. Arg. S. 5144, Refraction, for 2′ 7″.1 read 2′ 6″.8.
Page 20, O. Arg. S. 5144, App. N. P. D., for 49′ 15″.3 read 46′ 17″.9.
Page 21, B. A. C. 4165, Mean Thread, for 15′ 11″.38 read 15′ 11″.93.
Page 21, B. A. C. 4165, App. R. A., for 15′ 17″.17 read 15′ 17″.72.
Page 21, B. A. C. 4165, Mis. Corr., for $-58^s.90$ read $-58^s.77$.
Page 42, B. A. C. 4165, Inst. Corr., for $-2^s.28$ read $+2^s.28$.
Page 42, B. A. C. 4165, App. R. A., for $14^m\ 56^s.09$ read $15^m\ 0^s.65$.
Page 44, B. A. C. 4165, Mean Thread, for $40^s.30$ read $39^s.96$.
Page 44, B. A. C. 4165, Inst. Corr., for $+29^s.59$ read $+28^s.95$.
Page 44, B. A. C. 4165, App. R. A., for $15^m\ 0^s.13$ read $14^m\ 59^s.15$.
Page 53, B. A. C. 5694, Inst. Corr., for +4′ 14″.66 read +5′ 31″.21.
Page 53, B. A. C. 5694, Refraction, for +2′ 40″.0 read +2′ 40″.1.
Page 53, B. A. C. 5694, App. N. P. D., for 122° 7′ 16″.8 read 122° 8′ 33″.5.
Page 58, B. A. C. 4165, S. P., Mean Thread, for $40^s.45$ read $40^s.32$.
Page 58, B. A. C. 4165, S. P., App. R. A., for $13^s.78$ read $13^s.65$.
Page 84, B. A. C. 4165, S. P., Mean Thread, for $3^s.45$ read $5^s.56$.
Page 84, B. A. C. 4165, S. P., App. R. A., for $7^s.75$ read $9^s.86$.
Page 84, B. A. C. 4165, S. P., Mis. Corr., for $8^s.25$ read $8^s.22$.
Page 87, B. A. C. 4165, S. P., Mean Thread, for $28^s.80$ read $28^s.70$.
Page 87, B. A. C. 4165, S. P., App. R. A., for $20^s.30$ read $20^s.13$.
Page 137, Appendix VI, 4th line tan *n*, for 8.00910 read 8.00810.

YARNALL'S CATALOGUE, SECOND EDITION.

Page 99, for B. A. C. 2042 read B. A. C. 3042.
Page 107, star 4111^1. column Mean Dec., for 57′ read 5′.

APPENDIX VI.

OBSERVATIONS OF DOUBLE STARS.

Page, line 33, for 1°.82 read 1′.82.
Page 28, line 28, for sin $p^v \xi$ read sin $p^v \xi^1$.
Page 137, line 5, for 8.00910 read 8.00810.

REPORT OF THE SUPERINTENDENT OF THE OBSERVATORY TO THE CHIEF OF THE BUREAU OF NAVIGATION.

UNITED STATES NAVAL OBSERVATORY,
Washington, October 23, 1877.

SIR: In compliance with the instructions of the Bureau of the 11th instant, I have the honor to submit a report of the operations of the Naval Observatory for the past year.

TRANSIT INSTRUMENT AND MURAL CIRCLE.

During the year Prof. M. YARNALL has been engaged in observing with the Transit Instrument and the Mural Circle, observing alternately with each instrument such star-places as were deemed necessary to complete the catalogue of 1845–1871.

The methods of observation and reduction have been such as were used in past years, and it is hoped that a second and more perfect edition of this catalogue will be published in the course of the coming winter and spring. The catalogue embraces all the observations made in the Observatory with the old instruments by all observers, and forms an epoch in the annals of the Observatory. His time has been completely employed in these observations and in the reduction of the stars from the epoch in each year to that of 1860, the epoch of the catalogue. He has been assisted during the year by Lieut. E. W. STURDY, whose valuable services he takes pleasure in acknowledging. Mr. D. P. TODD was kind enough to observe for him several evenings without special assignment.

MOTION OF THE MOON.

The work of Prof. SIMON NEWCOMB on this subject, after suffering an interruption of some years, was recommenced in 1876. That part of it which consists of a new reduction and examination of all recorded eclipses and occultations of value before 1750 is substantially complete, the most of it being in the hands of the printer. The ancient observations, which have been considered most reliable, indicate a correction of more than half an hour to the times of ancient eclipses as hitherto calculated from the tables. This correction so changes the computed paths of the moon's shadow during total eclipses, that the chronological questions involved in them will no doubt have to be re-examined. The most remarkable result of the research is, that the motion of the moon during the past 250 years may be very closely represented by the alteration of a single term in Hansen's Tables. The question whether this alteration is admissible in the Theory cannot yet be decided.

TWENTY-SIX INCH EQUATORIAL.—(IN CHARGE OF PROF. ASAPH HALL, WITH PROF. E. S. HOLDEN AS ASSISTANT.)

This instrument has been employed the past year in the observation of the satellites of Saturn, Uranus, and Neptune, in observing double stars, and several comets. The observations of these satellites and comets have been published in the Astronomische Nachrichten. As the satellites of Uranus and Neptune have now been observed for several years with this instrument, and tables of their motions have been computed, it does not seem worth while to continue the observations of these satellites at the present time. In the year 1882 the plane of the orbit of the satellites of Uranus will pass through the sun, and at that time the apparent orbit of the satellite of Neptune will have opened so much that this satellite can be observed with ease in all parts of its orbit. It seems better, therefore, to give up, until the year 1881, the observations of the satellites of these two planets. In that year another and complete series of observations of these systems should be undertaken with this instrument. The fainter satellites of Saturn should be followed with this instrument for several years; and the curious phenomena connected with the ball and ring of this planet are also worthy of careful observation.

The list of thirty double stars selected by Mr. OTTO STRUVE, director of the Pulkowa Observatory, for the purpose of comparing the measures of different observers, has been observed by Professor HALL, and about two-thirds of the requisite number of observations have been made. This work will be finished during the next year.

The two satellites of Mars, discovered by Professor HALL in August, have been observed on nearly every clear night since their discovery, the date of the last observation being October 15, and the observations made at the Naval Observatory alone will give a good determination of their orbits. It seems now quite certain that these satellites will be visible again in October and November, 1879, and observations in that year will serve to fix their periods with accuracy.

This instrument is now in good working condition. Since the change in the bearing of the shaft of the driving-clock, made in July, 1876, the performance of the clock has been much better. It is doubtful if it be sufficiently steady for photographic or spectroscopic work, but it answers very well for micrometrical measurements.

The dome is now moved with considerable difficulty, probably on account of inequalities in the settling of the supporting walls. This should be remedied in some way.

During the next year, an equatorial telescope, having an aperture of 27 inches, will be mounted at Vienna; and the telescope made by Messrs. ALVAN CLARK & SONS for Mr. McCORMICK, and which is a little larger than ours, is ready for mounting. Under these circumstances, it is worth while to consider whether it would not be advantageous to establish a branch observatory on some of the elevated plains in the central part of this country. It seems probable that a good location might be found between the parallels of thirty and thirty-five degrees of north latitude, near the projected line of the Southern Pacific Railroad. Should such a location be found, at an altitude of six or eight thousand feet, its advantages might more than compensate the increased size of other telescopes. A branch observatory could be established in such a locality, and our 26-inch Equatorial could be mounted and used in such an observatory, for five or ten years, at no great increase of cost. Until some such thorough experiment be made, it is certain that the question of what is to be gained by observing at a station which is above a large part of our atmosphere will remain undecided.

A monograph on the central and brightest regions of the nebula of Orion is in preparation, and is now nearly completed, by Professor HOLDEN. The observations on which this depends have been made with the 26-inch Equatorial during the oppositions of 1874, 1875, 1876, and 1877, and will furnish data for determining the positions and boundaries of all the brighter nebulous masses. In connection with this, all previously published (and many unpublished) descriptions, drawings, and observations have been collected and studied, with the object of giving in one memoir a complete history of this nebula from its discovery in 1618 to 1878, a period of 260 years.

In order to present this evidence properly a series of wood-cuts or lithographs will be required, giving the most important features of the following drawings:

Drawings of the nebula of Orion.

No.	Observer.	Date.	No.	Observer.	Date.
1	Huyghens	1656	17	Rondoni	1841
2	Picard	1673	18	Lassell	1847
3	Huyghens	1694	19	W. C. Bond	1848
4	Mairan	1731	20	Lassell	1854
5	Long	1742	21	Liaponoff.	1847
6	Le Gentil	1758	22	Struve.	1851
7	Messier	1771	23	Secchi.	1862
8	W. Herschel	1774	24	Tempel	1862
9	Lefebvre	1779	25	G. P. Bond	1865
10	Schroeter.	1794	26	Rosse	1867
11	Schroeter.	1797-'8	27	Secchi.	1868
12	Bode	?	28	D'Arrest	1872
13	J. Herschel	1824	29	Winlock Trouvelot	1874
14	J. Herschel	1837			
15	Lamont	1837	30	Holden Trouvelot	1876
16	De Vico	1839			

Besides the above published drawings (a complete set of which is contained in no library in the world) several important unpublished original drawings have been communicated, in particular the elaborate drawing made by WILLIAM LASSELL, Esq., with his 4-foot reflector, in 1862.

The trifid nebula (G. C. 4355) has been studied in the same way, and the results have been published in the American Journal of Science, as the Naval Observatory had no funds to pay for the necessary illustrations.

TRANSIT OF VENUS.

The work done by Prof. WILLIAM HARKNESS is as follows:

The investigation of the errors of scale A of the measuring engine has been finished, and the errors themselves have been tabulated. In addition, the absolute value of the scale divisions has been determined; and, as the greatest care was taken in doing this, the engine is now capable of furnishing as accurate measurements as can be obtained by any means known to science.

The photographs of the transit of Venus obtained by the United States parties have been examined, and all those which were capable of measurement have been read off. They were as follows:

Northern stations.—Wladiwostok, 13 plates; Nagasaki, 50 plates; Peking, 26 plates; total, 89 plates.

Southern stations.—Kerguelen Island, 8 plates; Hobart Town, 38 plates; Campbell Town, 32 plates; Queenstown, 47 plates; Chatham Island, 7 plates; total, 132 plates.

The grand total for both hemispheres is 221 plates. Owing to the great variability of the photographic diameters of the Sun and Venus, it was found impossible to make use of any pictures which did not show a complete image of the Sun. This excluded several hundred small photographs taken near the times of contact between the limbs of Venus and the Sun.

The measurements of the photographs mentioned above have been so far reduced that the position-angles of Venus, relatively to the center of the Sun's image, and the positions of the Sun's image relatively to the centers of the plates, have been tabulated.

A method of determining the refractive index of a piece of plano-parallel glass has been devised, by means of which the refractive indices of all the reticule plates have been very accurately measured. These refractive indices, combined with the thicknesses of the reticule plates, are the data from which certain corrections to the measured focal distances of the photographic objectives have been computed. Their further reduction is under way, and it is expected that the reduction of all the observations of the transit itself will be brought to a close by the coming spring. It is also hoped that the observations for longitudes of stations will be reduced before the end of the fiscal year, and with the present appropriation. The volume of observations will require some illustrations, and an appropriation of $1,000 for this purpose has been asked for in the estimates.

Last spring some quantities relating to the Sun and Venus were tabulated, with a view to making a duplicate computation of the solar parallax, as derived from the photographs; but, for the present, that work has been abandoned.

THE TRANSIT CIRCLE.

This instrument, under the direction of Prof. J. R. EASTMAN, assisted by Assistants EDGAR FRISBY, A. N. SKINNER, and H. M. PAUL, has been employed in observations of—

1. Stars of the American Ephemeris, for clock and instrumental corrections.
2. Sun, moon, and planets.
3. Stars whose occultations were observed in connection with observations of the transit of Venus in 1874.
4. Standard stars for a catalogue of zone observations.

5. Stars used by Lieut. Commander F. M. GREEN in the determination of latitude in the West Indies.

6. Stars of the British Association Catalogue between 120° 0′ and 131° 10′ N. P. D.

7. Stars employed in observations of comets with the 26-inch and 9.6-inch Equatorials.

Clock-signals, for the determination of longitude, have been exchanged with the following stations: Cincinnati Observatory, on five nights; Hale's Eddy, N. Y., on four nights, for Coast Survey; Nashville, Tenn., on thirteen nights, for Coast Survey; Columbus, Ohio, on six nights, for Coast Survey; Wellsburg, N. Y., on two nights, for Coast Survey; Great Bend Village, Pa., on four nights, for Coast Survey; Harrisburg, Pa., on five nights, for Coast Survey.

Observations of Mars, for the determination of solar parallax, according to a plan proposed by Professor EASTMAN in 1876, have been made whenever the weather would permit.

THE 9.6 INCH EQUATORIAL.

This instrument is under the charge of Professor EASTMAN, with Messrs. FRISBY, SKINNER, and PAUL as assistants. It has been employed in the observation of occultations and in determining the approximate corrections to the ephemerides of such small planets as are not readily found with the Transit Circle.

Several observations have been made of the five comets (*a*), (*b*), (*c*), (*d*), and (*e*), of 1877.

The outer satellite of Mars was easily seen by Professor EASTMAN with this instrument on August 21 and 28, and by Mr. PAUL on October 1.

The *meteorological department* is under the charge of Professor EASTMAN; and the usual observations with the *barometer*, and the *dry*, *wet*, and *solar* thermometers have been made, commencing at midnight and recorded at each period of three hours after. The observations are made by the watchmen, Messrs. HAYS, HORIGAN, and CAHILL. The 200 extra copies of the observations for 1875 are ready for distribution to our meteorological correspondents, and the observations for 1876 are now ready for the printer.

The control of the system of wires within the Observatory connecting the various clocks, chronographs, &c., and of the connections with the wires of the Western Union Telegraph Company, is, as heretofore, in the hands of the officer in charge of the Transit Circle, while the immediate charge of all the batteries, wires, and their connections is successfully confided to Mr. W. F. GARDNER, the instrument-maker. The connections inside the buildings remain nearly the same as during the past year.

Beyond the Observatory, this department is responsible for the control, by means of the motor-clock, of several clocks in the State, War, Navy, and Treasury Departments, and for furnishing accurate time for signals to the Western Union Telegraph Company.

A thorough change in the method of controlling these clocks is required, and a proper and creditable distribution of time-signals will require the use of another clock and a change in the present method of sending the signals. These changes will necessitate the expenditure of about five hundred dollars, which sum is asked for, for this purpose.

Condition of instruments and observing-room.—The Transit Circle is in fair condition, and requires only very small immediate repairs. The observing-room is in a bad condition, and grows worse every year. Nothing but an entire remodeling of the roof and shutters will make them safe or suitable for the purpose for which they were designed.

The 9.6-inch Equatorial is in good condition, except that a new driving-clock is required. The dome is in good order, but the appliances are in a very bad condition—either worthless in design or worn out.

The meteorological instruments are in good condition.

The *distribution of publications and exchanges* is in charge of Prof. J. E. NOURSE.

The printing of the annual volume for 1875 was begun as soon as the appropriation for 1877 was available, and it is now about half done.

Of the annual volume of the Astronomical and Meteorological Observations for the year 1874, more than 600 copies have been distributed to observatories and other scientific institutions and libraries, and an equal number of the "Instruments and Publications of the Observatory," issued at the time of the International Exhibition.

More than 400 volumes have been sent abroad, chiefly through the agency of the Smithsonian Institution. The acknowledgments for these, received from the chief scientific institutions of the world, have been expressed in very appreciative terms.

Exchanges have been fully maintained during the year, promoting the growth of the library by the acquisition of standard works. In building up a library of special character, the Observatory has been almost exclusively dependent on these exchanges. To meet the increasing demands upon it, arising out of its own extending work, and to secure its full usefulness to scientific persons seeking to avail themselves of its facilities, an appropriation has become necessary for the purchase of works not available through exchange. For this purpose the sum of $1,500 is asked for in the estimates.

The *library* occupies a space in the Observatory originally constructed for the location of one of the transit instruments. It is ill-suited for library purposes, and is now found to be entirely too small to accommodate even the volumes on hand.

NARRATIVES OF ARCTIC EXPEDITIONS.

The limited edition of the Narrative of the North Polar Expedition, prepared by the late Admiral DAVIS, has been nearly exhausted by the effort to supply geographical societies, public libraries, and individuals specially interested in Arctic exploration. A large number of applications for this work continue to be unwillingly declined; and it is very desirable that a new edition may be ordered by Congress, the cost of which, printed from the stereotyped plates, would be inconsiderable.

Under the orders of the Navy Department of February 17, 1877, the Narrative of the Second Expedition of the late Capt. C. F. HALL, called for by Senate resolution of February 6, is being prepared at the Observatory by Professor NOURSE, with the assistance of Mr. R. W. D. BRYAN, of the Polaris expedition.

An estimate of the sum required for the necessary maps and plates for this work, recommended by the department February 17, is before the Naval Committee of the Senate. The papers forming the material of this work are those purchased by Congress under the act of June 23, 1874.

CHRONOMETERS.

There are at present in the chronometer-room eighty-nine mean-time chronometers; fifty-four are ready for issue; nine are on trial; and twenty-six need repairs. There are also six sidereal chronometers, three of which are "break-circuit."

During the year, seventy-seven chronometers have been received, and sixty-one have been issued. Of these, thirty-four have been issued to vessels of the Navy.

There are also one hundred condemned chronometers stored away. Ten of the best of these have been selected, and are being cleaned and put in order, to be used as *hacks.*

In issuing chronometers to vessels it is customary to select three, by different makers, all having a regular rate, and one of the condemned ones as a "hack."

In September arrangements were perfected for dropping a time-ball in New York City at exact New York noon; and on the 10th of that month the ball was dropped from the chronometer-room for the first time. It has been dropped at New York mean noon daily, except Sundays, to the present time, without a single failure.

It may be of interest to remark that the time-ball at Deal, England, which is dropped by signal from the Royal Observatory at Greenwich, is subject to about fifteen failures annually, or to an average of 1.25 per month.

This New York time-ball is already used by the merchant shipping, and has been employed also by the navigator of the United States steamship Guard, now fitting out at the Brooklyn yard, in rating the ship's chronometers.

The Baltimore Board of Trade contemplates the establishment of a similar time-ball at Baltimore, to be dropped at Washington mean noon daily, except Sundays; and it is to be hoped that similar time-balls may be established gradually at various other ports.

Very respectfully, your obedient servant,

JOHN RODGERS,
Rear-Admiral, Superintendent.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation, Navy Department.

GENERAL INTRODUCTION.

The Observatory was originally built as a depot of charts and instruments for the Navy, and was fully described in a "Report on the Plan and Construction of the Depot of Charts and Instruments, with a description of the instruments," etc., made by Lieut. **James M. Gilliss**, U. S. N., to the Secretary of the Navy, in February, 1845, and published as Senate Document No. 114, Twenty-eighth Congress, second session. A more general description, illustrated by plans and drawings, may be found in the volumes of Washington Observations for 1845, 1865, and 1874.

Position of the Observatory.—"The meridian of the Observatory at Washington shall be adopted and used as the American meridian for all astronomical purposes, and the meridian of Greenwich shall be adopted for all nautical purposes."[1] The latitude deduced from observations with the Mural Circle in 1845 and 1846 was + 38° 53′ 39″.25;[2] and that value has been used in the reduction of all observations with the Mural Circle down to the present time. The observations made with the same instrument from 1861 to 1864, inclusive, give a latitude + 38° 53′ 38″.8;[3] which has been used in the reduction of observations with the Transit Circle. The final north polar distances of objects observed with the Transit Circle in any year depend upon all the observations of circumpolar stars made during that year.

The longitude and the latitude of the Observatory are reckoned from the center of the old dome, which is built over the center of the main building.

The telegraphic determination of the longitude from Greenwich depends almost entirely upon the work of the United States Coast Survey. The following data are obtained from their official reports:

In August, 1872, the longitude was given as—

$$5^{h}\ 8^{m}\ 12^{s}.06 \pm 0^{s}.23,$$

and in August, 1873, it was announced by the assistant in charge of the office that the Coast Survey had made three independent determinations, with the following results:

	h.	m.	s.
In 1866	5	8	12.11
1870			12.10
1872			12.07
The value adopted by the Coast Survey[4] is	5	8	12.09

---

[1] Revised Statutes of the United States, section 435.

[2] Washington Observations, 1845, Appendix, p. 116.

[3] Washington Observations, 1864, Introduction, p. xliv.

[4] Report of the Superintendent of the U. S. Coast Survey, 1874, page 182.

In interpolating tabular positions of the moon and planets, the longitude of the Observatory is assumed to be $5^h\ 8^m\ 12^s.0$.

Since the Observatory was built, there have been several changes in the positions of its instruments; and in order to facilitate comparisons of the work done with them at different times, their co-ordinates, measured from the center of the old dome, are given in the following table. The sign + before a co-ordinate indicates that the instrument is north or west of the center of the dome, and the sign — indicates that it is south or east of that point.

Instruments.	Diff. of latitude.		Diff. of longitude.	
	Feet.	"	*Feet.*	s
Transit:				
January, 1845, to September 2, 1864 .	0.0	0.00	+ 41.0	+ 0.035
Since October 1, 1864.	0.0	0.00	— 42.9	— 0.036
Mural Circle:				
January, 1845, to September 15, 1845 .	0.0	0.00	+ 32.0	+ 0.027
Since October 1, 1845.	0.0	0.00	— 33.9	— 0.029
Meridian Circle:				
January, 1845, to August, 1864 . . .	0.0	0.00	— 42.9	— 0.036
Prime Vertical Transit:				
Since January, 1845	— 45.4	— 0.45	0.0	0.000
Transit Circle:				
January 1, 1866, to June 5, 1869 . .	0.0	0.00	+ 38.4	+ 0.032
Since October 1, 1869	0.0	0.00	+ 77.8	+ 0.066
26-inch Equatorial (center of dome):				
Since November 15, 1873	— 120.1	— 1.19	0.0	0.000

Arrangement of work.—The system adopted at the time of the revival of the astronomical activity of this establishment in 1861 is still continued. Under this system, the observations with each instrument are directed by the officer having it in charge, who is held responsible for the proper performance of the work, and prepares the descriptions, explanations, and discussions of the observations in the annual volumes.

During the year the details for duty were as follows:

The Transit Circle was under the direction of Prof. J. R. **Eastman**, U. S. N., assisted by Assistants E. **Frisby**, A. N. **Skinner**, and H. M. **Paul**.

The Prime Vertical Transit was not used during the year.

The Mural Circle and Transit Instrument were under the direction of Prof M. **Yarnall**, U. S. N., who was assisted in computing by Lieut. E. W. **Sturdy**, U. S. N.

The 9.6-inch Equatorial was under the direction of Prof. J. R. **Eastman**, U. S. N.

The 26-inch Equatorial was under the direction of Prof. A. **Hall**, U. S. N., who was assisted by Prof. E. S. **Holden**, U. S. N.

The meteorological observations were made, under the supervision of Prof. J. R. **Eastman**, U. S. N., by the watchmen of the establishment, Messrs. **Thomas Hays**, **Dennis Horigan**, and **Nicholas Cahill**.

In the Chronometer Department the following officers were on duty for the periods specified:

Lieut. Commander C. H. **Davis**, Jr., U. S. N., from January 1 to October 13;

Lieut. Commander G. W. PIGMAN, U. S. N., from January 1 to December 31; Lieut. GEORGE E. IDE, U. S. N., from October 1 to December 31; Lieut. H. G. O. COLBY, U. S. N., from January 1 to May 4; Lieut. L. C. LOGAN, U. S. N., from February 10 to May 1; Lieut. T. N. LEE, U. S. N., from January 1 to March 20; Master J. W. GRAYDON, U. S. N., from June 18 to December 31; Master PERRIN BUSBEE, U. S. N., from January 1 to April 17; Ensign WILLIAM H. SLACK, U. S. N., from February 20 to April 17.

Mr. W. F. GARDNER, instrument-maker, executed all necessary repairs and alterations of the instruments and apparatus of the Observatory.

Mr. THOMAS HARRISON, clerk and disbursing officer, had charge of the official correspondence and accounts of the establishment.

The Observatory, being a naval establishment, is under the general supervision of the Bureau of Navigation of the Navy Department.

THE TRANSIT CIRCLE.

During the year 1877 the work with the Transit Circle was carried on under the direction of Prof. J. R. Eastman, U. S. N.

The Assistants were Messrs. Edgar Frisby, A. N. Skinner, and H. M. Paul.

The regular observations with the Transit Circle were confined to the following classes of objects:

(1) Stars of the American Ephemeris, for the determination of clock corrections, azimuth corrections, and the corrections to the zenith point and the assumed latitude.

(2) Sun, moon, and planets.

(3) Stars whose occultations were observed at this Observatory and by the various American parties who observed the Transit of Venus in 1874.

(4) Stars selected for standard stars in the formation of a catalogue from the zone observations made here from 1846 to 1849.

(5) Stars used for latitude determinations by parties attached to the expedition of Lieut. G. M. Wheeler, United States Engineers, in charge of explorations and surveys west of the one hundredth meridian.

(6) Stars used by Lieut. Commander F. M. Green, U. S. N., in his determinations of latitude in the West Indies.

(7) The Stars of the British Association Catalogue between 120° 0′ and 131° 10′ N. P. D. that have not been observed here three times in right ascension and declination.

THE OBSERVING-ROOM.

The interior of the observing-room, which has been occupied since February 2, 1870, measures 40 feet from north to south and 28 feet 3 inches from east to west. Its height, from the floor to the under side of the shutters which close the opening in the roof, is 23 feet 2 inches at the ridge and 19 feet 6 inches at the eaves. The ridge of the roof extends east and west. The opening in the roof has a width of 3 feet 8 inches, and extends downward, in the north and south walls, to within 7 feet 4 inches of the floor. The portion in the roof is closed by means of four sliding shutters, while that in the north and south walls is closed by double doors.

The inside of the walls of the frame on the east, south, and west sides is covered with tin, and the outside of the frame is protected from the direct rays of the sun by light, wooden louver-work. The northern wall is covered on the outside with tin. The outside is painted white and the inside light blue.

The latitude of the Transit Circle is the same as that of the center of the central dome of the Observatory, but in longitude it is 77.8 feet $= 0^s.066$ west of that point.

DESCRIPTION OF INSTRUMENTS.

THE TRANSIT CIRCLE.

A detailed description of the Transit Circle, together with an account of the investigation of its constants, may be found in the Washington Observations for 1865. The following condensed description will be sufficient to render intelligible the explanation of the observations and their reduction.

This instrument was made by Pistor & Martins, of Berlin, in 1865. It is of the reversible pattern, and is mounted upon two massive marble piers, with its axis 8 feet 2 inches above the floor. The telescope has a clear aperture of 8.52 inches, and a focal length of 12 feet and 0.7 of an inch. The axis is cast in a single piece, into which the steel pivots, 2.09 inches in diameter and 1.7 inch long, are screwed. The Y's are of gun-metal, and the bearing-surfaces are 0.28 inch wide. The distance between the centers of the bearing-surfaces is 3 feet 9.1 inches. The telescope-tube is made in two similar parts, which are bolted to the opposite sides of the cube which forms the central portion of the axis. The cube measures 16.64 inches on the edge.

Two circles, identical in form and size, are attached to the extremities of the axis. Each has ten radial arms, is cast in a single piece weighing about eighty pounds, is 45.3 inches in diameter at the outside edge, and 43.4 inches at the graduation. The circle on the clamp end of the axis, known as circle A, has inlaid upon its face two bands of silver, each 0.13 of an inch wide, the inner one of which is graduated to every 2′, and the outer one to every 10′. The other, known as circle B, has inlaid upon its face a single band of silver 0.13 of an inch wide, which is graduated to every 2′. The graduation on each of these circles is numbered, from left to right, from 0′ to 360°, and, as they face in opposite directions, when the telescope is moved in zenith distance, the reading of one circle increases while that of the other decreases. The circles are attached to the axis in such a manner that they may be adjusted to bring any desired divisions under the microscopes in a given position of the telescope. Each pier carries four micrometer microscopes placed at the extremities of two diameters, which intersect at right angles, and each of which makes an angle of 45° with the vertical. They are attached by means of metal arms, covered with wood, to the brass disk on the face of the pier, which supports the Y's. The microscopes on the western pier are marked I, II, III, IV; those on the eastern pier, V, VI, VII, VIII. The readings of the former diminish and those of the latter increase as the telescope moves from the zenith toward the south. These microscopes magnify about forty-five diameters; one revolution of their screws is equal to 30″, and their micrometer-heads are divided to 0″.5. Each microscope micrometer is furnished with two parallel threads about 12″ apart, and the reading is made when the image of the division on the limb of the circle appears to be exactly midway between the threads.

In addition to the microscopes already mentioned, each pier carries another, which is employed as a pointer for setting the telescope by means of the coarse graduation on circle A. These microscopes magnify twenty-three diameters, and are placed at the extremities of horizontal radii to the circles; that on the western pier being north and that on the eastern pier south of the axis. The setting microscope in actual use is always the one at the clamp end of the axis.

In the eye-piece of the telescope is a fixed reticule of fifteen vertical and two horizontal threads. The latter have a space of about 8″ between them, and are inserted principally to mark the center of the field. The notation, and the approximate equatorial intervals between each vertical thread and the mean of sets B and D, and C_2, C_3, and C_4, are as follows:

TABLE I.

	s.		s.		s.
I	36.8	C_1	4.1	D_1	8.2
II	24.5	C_2	2.0	D_2	9.6
III or B_1	12.2	IV or C_3	0.0	V or D_3	12.3
B_2	9.7	C_4	2.0	VI	24.5
B_3	8.2	C_5	4.1	VII	36.8

The threads B_1 to B_3 are known as set B; C_1 to C_5 as set C; and D_1 to D_3 as set D. The thread on the western side of the field is always known as I; therefore, when the instrument is reversed, the notation of the threads is reversed.

The eye-piece also contains a right-ascension and a zenith-distance micrometer in each of which the readings increase as the threads move from the micrometer-head The right-ascension micrometer is provided with a single vertical thread, and is employed in determining the collimation constant, and sometimes in observing the transit of close circumpolar stars when clouds prevent observations at the fixed threads. The value of one revolution of the micrometer screw is $1^{s}.024$. The zenith-distance micrometer is furnished with five horizontal threads, two of which are about 3″ apart, and the center of the space between them is regarded as the standard middle thread. The value of one revolution of this micrometer-screw is 15″.312. Two of the other threads are placed at a distance of about 2′ 33″ on either side of the middle threads; that nearest the head of the micrometer being called thread A, and the other thread B. For observing Mars at the opposition in 1877 a fifth thread, *b*, was inserted beyond B, and about 2′ 50″ from the middle threads. On August 4 the collimating thread and thread *b* were found to be in contact. The eye-piece was removed, the collimating thread replaced by a new one, a new score cut for thread *b*, which was replaced by a new thread at a distance of about 2′ 55″ from the middle threads. In observing southern stars, the micrometer-head is below the eye-piece if the clamp is west, and above it when the clamp is east. An increase of micrometer reading is subtractive from the reading of circle A, and additive to that of circle B. A self-registering apparatus is attached to the head of the micrometer-screw in such a manner as to enable the observer to obtain a record of at least four bisections without removing the eye from the eye-piece.[1]

The illumination of the field of view is so arranged that the threads can be shown either dark on a bright field or bright on a dark field. In the case of bright-field illumination, the color can be varied from deep red to dark blue.

The instrument is provided with five positive eye pieces, magnifying respectively 135, 158, 186, 279, and 395 diameters. That magnifying 186 diameters is the one generally used.

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[1] See Astronomische Nachrichen, No. 1493, p. 77.

Collimators.—The Transit Circle is provided with two collimators, having object-glasses of 35.2 inches focal length, and 2.1 inches clear aperture. The eye-pieces have a power of 67. The collimators are mounted on sandstone piers, the one north and the other south of the Transit Circle, and 14.8 feet from the center of the instrument. The field of view of collimator A contains a vertical thread crossed at its middle point by a horizontal thread. The field of view of collimator B contains a fixed vertical thread, and two intersecting threads, movable by a micrometer-screw. Each of the intersecting threads makes an angle of 12° with the vertical. Collimator A is usually mounted on the south pier Two levels are provided by which the collimators may be placed horizontal.

Each side of the central cube of the Transit Circle telescope is pierced with a circular opening, 2.3 inches in diameter, which is closed by a brass cap. By removing the caps, and setting the telescope vertical, the threads of either collimator may be seen from the other.

The standard sidereal clock.—The sidereal clock, used in connection with the Transit Circle, is Kessels No. 1324. In order to provide against the effects of sudden changes of temperature, the clock, which is situated in the room adjoining the observing-room on the eastern side, is inclosed in a vault of heavy masonry lined with tin, and, to prevent the works of the clock from rusting, the dryness of the air is maintained by keeping a fire in the clock-room throughout the year. The clock has a gridiron pendulum, and was formerly connected with the galvanic system of the Observatory by means of a platinum point which projected from about the middle of the pendulum-rod, and at each vibration lightly touched the surface of a small globule of mercury and closed the circuit. At the beginning of 1877 this platinum point was changed to the lower end of the pendulum-bob. The clock is connected with the chronograph in the usual way.

The rate of the clock is controlled by means of small weights, which can be placed in a small cup attached to the pendulum-rod.

The counting-clock.—This clock is attached to a brick pier near the eastern wall of the observing-room. It was made by Parkinson & Frodsham, of London, and has a mercurial pendulum. Its rate is controlled by means of small weights placed on the top of the jar of mercury, and it is kept within less than half a second of the Kessels clock.

This clock contains a delicate spring, furnished with a platinum point, resting upon a small plate of the same metal; the whole so arranged that at the beginning of each minute an arm attached to the arbor of the seconds hand raises the spring and separates the point from the plate for nearly one second Wires are attached to this apparatus, so that if desired it may be included in the same circuit with the Kessels clock, when, if the beats of the two clocks are nearly in coincidence, the mark for the sixtieth second of the Kessels clock will be omitted on the chronograph.

The standard mean-time clock.—This clock is attached to a stone pier in the chronometer-room, but the officer in charge of the Transit Circle is responsible for furnishing its errors and rates. It was made by Parkinson & Frodsham, of London; has a mercurial pendulum; and its rate is controlled by means of small weights placed on the jar containing the mercury. It is compared with Kessels No. 1324 by causing their beats to be recorded on the same chronograph, generally until a coincidence is obtained. This clock is considered the best in the Observatory.

The Chronograph.—This instrument is mounted on a wooden stand near the eastern wall of the observing-room. It is a modified form of the Hipp chronograph, in which regularity of motion in the train is secured by a spring making 132 vibrations a second. The barrel of the chronograph is 6.37 inches in diameter, 13.5 inches long, and revolves once in a minute. A sheet of paper fastened on the chronograph barrel by thin metallic springs is sufficient to contain the record of two hours' continuous work, and the train requires winding only when the paper is changed. The clock-signals and those of the observer are recorded by a single pen. The armature of the magnet which controls the pen is provided with repeating-points for use in sending signals to distant stations when determining differences of longitude by telegraph. The pen-carriage is moved forward by an endless screw, but may be lifted from its bearings and moved backward and forward so that the pen may be placed upon any desired part of the chronograph sheet. The chronograph stops when the sheet is full. The record is made on paper of the quality of ordinary writing-paper with an ink that does not freeze at 0° F. The ink is made in the following proportions:

Water - - - - - - - - - - - -	4 fluid ounces.
Alcohol - - - - - - - - - - -	2 fluid ounces.
Concentrated glycerine - - - - -	1 fluid drachm.
Crystalized aniline blue - - - - -	40 grains.

This ink requires thorough filtering. The pen is of glass, and the lower part of the bulb is drawn out to a fine capillary tube, so that, when ink is placed in the bulb and the pen allowed to rest its whole weight on the paper, it produces a fine sharp line as the barrel revolves.

The barometer and thermometers.—The barometer is of the cistern form, and is suspended on the eastern wall of the observing-room, near its northeastern corner. This instrument has a tube about 0.3 of an inch in diameter, and the graduation may be read by means of a vernier to 0.01 of an inch. The *attached* thermometer has a Fahrenheit scale graduated from + 2° to + 125°. The *external* thermometer has a Fahrenheit scale, and is graduated from — 36° to + 157°. It is suspended 1 foot outside the north front of the observing-room, 13.5 feet above the grass, and is protected from radiation by a shield formed by a double roof of boards, the upper one covered with tin painted white, and three sides of wooden double louver-work. The *upper* thermometer is suspended above the nadir stage, with the bulb nearly as high as the object-glass when the telescope is pointed towards the zenith. It has a Fahrenheit scale graduated from + 4° to + 144°.

Personal equation apparatus.—The apparatus for determining the personal error of an observer in noting the time of the transits of stars is the one described in the Introduction to the Transit Circle work in the volume for 1875, and has been used during the year 1877 to determine the personal equation of all the observers with the Transit Circle.

Reflection apparatus.—The apparatus described in the Introduction to the Transit Circle work in the volumes for 1875 and 1876 was used during 1877 for observing stars by reflection.

In practice the rule generally followed was to make the bisections for the direct and reflected observations symmetrical with regard to the central thread; in most cases for reflection observations at threads I and II, and for direct observations at VI and VII.

OBSERVATIONS WITH THE TRANSIT CIRCLE.

Position of axis.—The system of observations with this instrument is based on the plan of reversing the axis at the beginning of each year, and at the same time shifting the position of circle B on the axis so that the north polar distances of the same object will depend on different circle-divisions in different years. During the year 1877 the clamp end of the axis was east.

Arrangement of work.—During the year 1877 there were four observers attached to the Transit Circle, who made all the observations and computations except such computations and copying as could be obtained for less than one thousand dollars. As a rule, each observer is held responsible for all the observations to be made during an "observing-day" of twenty-four hours, beginning at 9 a. m.

The usual observing-hours are from 9 a. m. to 3 p. m. and from 8 p. m. to an hour late enough to observe whatever small planets may be near opposition. It is a rule to observe the moon whenever it can be seen at time of transit, and on Sundays the only observations regularly made are those of the moon and of stars necessary for the determination of time and instrumental constants.

Generally, in clear weather, it is designed to observe a group of at least three "time stars" in the forenoon and three in the afternoon, and also a similar number near the beginning and the end of the work at night.

The azimuth constant is considered invariable throughout the "observing-day"; but the collimation and level constants and the zenith-point correction are generally determined at about the middle of the observations for each day and each night. If the observations are prolonged to a very late hour at night these constants are generally determined twice.

The number of observations to be obtained in an "observing-day" has not been fixed, for, with rare exceptions, the zeal of the observers leaves no necessity for fixing a minimum limit.

Method of observing.—A galvanic current, closed by the Kessels clock, controls the chronograph-pen, and all observations of time are made by the aid of its recorded beats. Therefore, the first duty of the observer is to put the counting-clock in coincidence with the Kessels. Then the counting-clock serves to indicate the second corresponding to each beat of the chronograph-pen, and when included in the clock circuit it also indicates the beginning of each minute on the chronograph by causing the pen to omit the mark corresponding to the sixtieth second.

The general method adopted in using the Transit Circle is to bring the proper divisions of circle B near the zeros of its micrometer microscopes, and then to measure with the zenith-distance micrometer of the telescope the distance between its zero-point and the image of the object observed. The subdivision of the intervals between consecutive divisions on circle B is thus thrown entirely on the zenith-distance micrometer, and as the arc measured by the micrometer microscopes rarely exceeds 10″ their errors of run are neglected. The graduation of circle B is considered better than that of circle A, and is consequently employed in all measures of zenith-distance. Circle A is used only as a setting circle, to indicate the degrees and minutes of zenith distances, and its position on the axis is never changed. If a collimating eye-piece is attached to the telescope, its zenith-distance micrometer set at 35 revolutions, and the instrument turned until the central micrometer-wires coincide with their own images reflected from the surface of mercury, the reading of the horizontal microscope of circle A will be 179° 56′, and some divisions of circle B will be found very nearly under the zeros of its micrometer microscopes.

Let

R denote the reading of the horizontal microscope of circle A when the telescope points to the zenith;

φ, the latitude of the Transit Circle;

δ, the declination of the object;

r, the refraction of the object;

Then, when the clamp is west, the telescope must be set so that the reading of the horizontal microscope of circle A will be,

For a direct observation - - - - - $R - \varphi + \delta \pm r$
For a reflection observation - - - - $180^\circ + R + \varphi - \delta \mp r$

If the clamp is east, the reading will be,

For a direct observation - - - - - $R + \varphi - \delta \mp r$
For a reflection observation - - - - $180^\circ + R - \varphi + \delta \pm r$

If the true value of φ were substituted in these expressions, whenever the computed setting was not exactly an even minute, it would be necessary to set on the *nearest* even minute. In practice, it is found much more convenient to set on the *next less* even minute; and, in order to avoid measuring more than half the distance between two consecutive divisions on the circle with the zenith-distance micrometer, a fictitious value of φ is used. The fictitious latitude is $\varphi + 1'$ for a direct observation with clamp east, and a reflection observation with clamp west; and $\varphi - 1'$ for a direct observation with clamp west, and a reflection observation with clamp east. The formulæ actually employed for computing the settings are, therefore,

For a direct observation, clamp east - - - $38^\circ\ 50'.6 - \delta \mp r$
For a reflection observation, clamp east - - $141^\circ\ 3'.4 + \delta \pm r$
For a direct observation, clamp west - - - $321^\circ\ 3'.4 + \delta \pm r$
For a reflection observation, clamp west - - $218^\circ\ 50'.6 - \delta \mp r$

In these formulæ, r is taken with the upper sign for an object south, and with the lower sign for an object north of the zenith. For the moon, r is made equal to the sum of the refraction and parallax. In observing faint objects, it is often desirable to know the approximate reading of the zenith-distance micrometer for the point at which the object will enter the field of view. In both positions of the clamp the reading is computed from the formula,

$$\text{Micrometer reading} = 39 \text{ revolutions} - \frac{\varepsilon}{R}$$

where ε is the difference between the computed setting and the next less even minute, and R is the value of one revolution of the micrometer-screw.

The adopted mode of observing is to move the zenith-distance micrometer until the image of the star or of the limb of the sun, moon, or planet bisects the space between the two middle threads of the micrometer, and this operation is called, in this introduction, briefly, *bisecting* the object. It is not easy to observe very faint objects in this way, and such are bisected with the threads A or B. These latter threads are also used, in order to avoid moving any thread more than two minutes, when observing two or more objects on the same setting, differing more than two minutes in declination. All bisections are made by always moving the micrometer-threads *from* the head. The microscope-micrometer threads are always moved *toward* the head. The readings of the zenith-distance micrometer are taken from the self-registering indexes after the completion of each observation

Three persons are usually employed in making a complete observation of the four limbs of the sun, though it is sometimes accomplished by two. The setting for the north and south limbs is computed, a paste-board cap with a circular aperture three inches in diameter is put over the object-glass, a shade-glass is placed on the eye-piece, and the telescope set for the position of the sun's center. About two minutes before the predicted time of transit of the sun's center, the shutters are opened, and the observer notes the time of transit of the preceding limb over the eleven transit threads in the usual way. The assistant at circle A now sets the telescope for the observation of one of the horizontal limbs, and, while the observer is making the bisections at threads I and II, the assistant at circle B reads the four microscopes. This done, the telescope is set for the other limb, the bisections at threads VI and VII are made, and the assistant at circle B again reads the four microscopes. The telescope is then unclamped and moved until the following limb is in the field, when its transit over all the threads is observed. The shutters are then closed, and the observation completed by making the usual observations of the external thermometer, barometer, and attached thermometer. During the observation, the circles are protected from the direct rays of the sun by the steps and platform used in observing the nadir point.

In observations of the moon, if the preceding limb is the full one, the settings for the center and for the full horizontal limb are computed and the instrument set for the center, but not clamped. The transit of the preceding limb is then observed, and the observer going to circle A sets the instrument on the full horizontal limb. Returning to the eye-piece, he makes the bisections usually at threads II, III, IV, V, and VI. The observation is completed by reading the microscopes of circle B.

If the following limb is full, the telescope is set for the position of the full horizontal limb, and the microscopes are read before the moon enters the field. After the bisections are made, the telescope is unclamped and moved till the following limb is in the field, when the transit is observed in the same way as for the preceding limb.

When the larger planets are observed, the bisections of one limb are made at threads I and VII, and of the other at II and VI. In the observations of Mars at opposition in 1877 the zenith-distance of the planet was determined by moving the threads B and *b* until they cut off equal segments from the north and the south limbs of Mars. The transit of the preceding limb is usually observed at sets B and D, and of the following limb at set C, though this order is sometimes reversed.

Planets which do not present a well-defined disk are observed in the same manner as fixed stars.

The general plan for observing fixed stars is as follows:

(1) If the star is within 5° of the pole, the transit is observed by eye and ear at the threads of set C, and it is bisected at C_1, C_3, and C_5, or sometimes at all the threads of the set.

(2) If the star is situated between 5° and 20° of polar distance, the transits over set C are recorded on the chronograph in the usual way, and it is bisected at any two of the threads B_1, B_3, D_1, D_3; preference being given to the combinations B_3, D_1, or B_1, D_3, which make the observation symmetrical.

(3) If the polar distance of the star exceeds 20°, its transit over the eleven threads is recorded on the chronograph, and the bisections are made at any two of the threads I, II, VI, VII; preference being given to the combinations II, VI, or I, VII. Sometimes bisections are made at each of the threads I, II, VI, VII.

(4) In the case of double stars, the transit of one component is usually observed over sets B and D, and of the other over set C. The bisection of one component is made at threads I and VII, and of the other at threads II and VI.

In observing transits by eye and ear, the beat of the chronograph-pen is used and not that of the counting-clock.

Thread intervals.—The following thread intervals were determined early in 1877, and were employed throughout the year.

TABLE II.

	s.		s.		s.
B_1	+ 12.230	C_1	+ 4.078		
B_2	9.681	C_2	+ 2.035		
B_3	8.166	C_3	+ 0.011	D_1	− 8.174
		C_4	− 2.051	D_2	9.642
		C_5	− 4.095	D_3	− 12.255

In reading all complete observations from the chronograph sheets the records for C_1 and C_5 are omitted, and the remaining nine threads are considered the standard set.

The zenith-distance micrometer-screw.—From a series of observations made in 1873, the value of one revolution of the zenith-distance micrometer-screw was found to be 15″.312, and this value has been used in reducing the observations made in 1877.

When the close pair of micrometer-threads occupies the center of the space between the fixed horizontal threads, the reading of the micrometer-screw is 40 revolutions, and the reading increases as the threads move from the micrometer-head.

The right-ascension micrometer-screw.—The adopted value of one revolution of this screw is $1^{s}.024$. This value was determined by measuring the intervals between the transit threads, which had been determined by the transits of stars near the pole.

Inclination of threads.—The corrections for inclination of micrometer-threads used in 1877 are given in the table below.

TABLE III.

Inclination of Threads.

	From January 1 to August 4, 1877.				From August 6 to December 31, 1877.			
Vertical Thread.	Corr. for Inclination of Central Threads.	Correction for Thread A.	Correction for Thread B.	Correction for Thread *b*.	Corr. for Inclination of Central Threads.	Correction for Thread A.	Correction for Thread B.	Correction for Thread *b*.
	″	′ ″	′ ″	′ ″	″	′ ″	′ ″	′ ″
I	− 1.17	+ 2 31.95	− 2 34.09	− 2 51.99	− 1.39	+ 2 31.37	− 2 34.69	− 2 56.33
II	0.78	2 32.34	2 33.60	2 51.45	0.93	2 31.83	2 34.23	2 55.87
III	− 0.39	2 32.72	2 33.10	2 50.90	− 0.47	2 32.29	2 33.77	2 55.41
IV	0.00	2 33.11	2 32.61	2 50.36	0.00	2 32.76	2 33.30	2 54.94
V	+ 0.39	2 33.50	2 32.12	2 49.82	+ 0.47	2 33.23	2 32.83	2 54.47
VI	0.78	2 33.88	2 31.62	2 49.27	0.93	2 33.69	2 32.37	2 54.01
VII	+ 1.17	+ 2 34.27	− 2 31.13	− 2 48.73	+ 1.39	+ 2 34.15	− 2 31.91	− 2 53.55

The corrections for threads A, B, and *b* in the above table contain, besides the correction for inclination, the reduction to the middle pair of threads.

Collimation constant.—The collimation constant is determined by means of the collimators, without reversing the instrument.

The covers of the opening through the central cube of the telescope are removed, and the instrument turned until the horizontal thread in collimator A appears in the field at about 35 revolutions. Then by means of the screws acting against the Y's of collimator A, its vertical thread is moved until it is seen very near the image of C_3 in the telescope. Three measures of the small distance between C_3 and the image of the vertical thread in the collimator are then made with the right-ascension micrometer by moving its thread until the collimator thread bisects the space between the movable thread and C_3, and by obtaining a coincidence between C_3 and the movable thread. The deviation will be half the space measured by the movable thread.

The telescope is then pointed to the zenith, and the micrometer of collimator B is moved until the intersection of its cross-threads is exactly on the image of the vertical thread of collimator A. The telescope is then pointed on collimator B, and four measures made of the distance between C_3 and the intersection of the cross-threads. These measures are made in the same manner as those on the vertical thread of collimator A.

The telescope is again pointed to the zenith, and the adjustment of the vertical thread of collimator A on the cross-threads of collimator B is examined. If it is imperfect, it is readjusted, and another set of measures similar to the first is made. The mean of the first and last sets of measures is taken as the true distance of C_3 from the image of the vertical thread of collimator A. Care is taken to determine the value of c_0 when the temperature is changing very slowly.

In the computation of the constant from these data in 1877,

$c_\tau =$ the sum of the collimation constant at the temperature τ° Fahr., and the constant of diurnal aberration;

$c_0 =$ the sum of the same constants at the temperature 0° Fahr.;

$M =$ the distance, in micrometer revolutions, of the image of the vertical thread of collimator A *east* of C_3;

$M' =$ the distance, in micrometer revolutions, of the image of the intersection of the threads in collimator B *east* of C_3;

$R =$ the value, in seconds of time, of one revolution of the micrometer-screw $= 1^s.024$;

$\varphi =$ the latitude of the Observatory;

$i =$ the reduction of the position of C_3 to the mean of the set of nine threads $= + 0^s.011$ during the year.

Then, if M and M' have been observed at the temperature τ° Fahr.,

$$c_\tau = \tfrac{1}{2}\,(M + M')\,R - 0^s.021 \cos\varphi - i = 0^s.512\,(M + M') - 0^s.016 - i.$$

In the Transit Circle the collimation varies with the temperature, and from a discussion of many observations, made at widely different temperatures, it has been found that

$$c_0 = c_\tau \mp 0^s.004\ \tau$$

where the upper sign is used when the clamp is east, and the lower when it is west.

As the value of c_0 has been found to be very steady throughout the year for several years, it is usually determined two or three times a month. For special observations on other days, the value of c_0 is obtained by interpolation, and from it, and the observed temperature at the time, the actual collimation constant is obtained from the formulæ

$$c_\tau = c_0 \pm 0^s.004\ \tau$$

For the final reduction of observations with the Transit Circle, a constant value of c_0 is used during the period that the thread C_3 remains undisturbed. The value used is the mean of all the values determined by observation. These values will be found in Table A of this Introduction.

The level constant.—The instrument employed is a hanging level. Its tube is three-quarters of an inch in diameter, 10 inches long, and has a chamber at one end, so that the length of the bubble is adjustable. It seems to be most sensitive when its length is about 1.25 inch. The scale is numbered continuously from end to end, the numbers running from 0 to 90. The length of one division is about 0.09 inch, and its value is $0^s.058$.

In using the level, it is always reversed twice, giving two readings with it direct and two with it reversed.

In computing the constant from the observations,

b = the level constant;

W and E = the sum of the two readings of the west and east ends of the bubble with the level in its first position;

w and e = the sum of the two readings of the west and east ends of the bubble with the level reversed;

Hence,

$$b = 0^s.00725\ [(W + E) - (w + e)]$$

When the $\left\{ \begin{matrix} \text{west} \\ \text{east} \end{matrix} \right\}$ end of the bubble gives the greatest reading, the sign of b is $\left\{ \begin{matrix} + \\ - \end{matrix} \right\}$

A careful examination of the pivots indicates that they are sensibly round and equal in diameter.

The azimuth constant.—The azimuth constant is generally determined from the observed transit of one or more of the "azimuth stars"—Polaris, δ Ursæ Minoris, 51 Cephei, or λ Ursæ Minoris—by means of the formula

$$a = \frac{\alpha - (T + \Delta T + Bb + Cc)}{A}$$

where a, b, and c are the azimuth, level, and collimation constants; A, B, and C, the azimuth, level, and collimation factors; α, the adopted right ascension of the star; T, its observed time of transit; and ΔT, the approximate clock correction at T. When the same star is observed, both above and below the pole, on the same observing-day, the mean of the constants derived from those observations is adopted for the azimuth constant for that observing-day.

If no star is observed above and below the pole, the adopted constant is the mean of the results obtained from such azimuth stars as have been observed.

If from any cause no azimuth stars are observed, the constant is derived from the observed places of all the known stars by the method of least squares.

The zenith point correction from nadir observations.—This constant is determined from observations of the nadir point with a Bohnenberger eye-piece in the following manner:

(1) The telescope is pointed downward over a box of mercury, set so that the circle reading is 179° 56′, and the four microscopes at circle B are read.

(2) Two readings of the zenith-distance micrometer are then taken by moving the close pair of micrometer-threads until the space between them and their images, reflected from the mercury, appears equal to the distance between the two threads, the threads being nearer the head of the micrometer.

(3) Four readings of the micrometer are next made in the same way as before, except that the threads are placed the other side of the images.

(4) Two more readings of the micrometer are then made in the same manner as the first two, and the microscopes at circle B are again read.

The mean of the eight micrometer readings will give the reading for the coincidence of the two threads and their images. The second circle reading is taken for a check on the first.

The observations are reduced by means of the formula:

$$\text{Zenith-point correction} = \left\{\begin{array}{l} 180^\circ + \text{Division correction for circle B} \\ \qquad + \text{Correction for flexure of circle B} \\ \qquad + \text{Correction for flexure of telescope} \\ \qquad - \text{Constant added to reduction to meridian} \end{array}\right\}$$

$$-\left\{\begin{array}{l} 179^\circ\ 56 \pm 10 \text{ revolutions of micrometer micro-} \\ \qquad\qquad \text{scopes.} \\ \qquad \mp \text{ Observed reading of micrometer mi-} \\ \qquad\qquad \text{croscopes.} \\ \qquad + \text{ Micrometer equivalent corresponding} \\ \qquad\qquad \text{to the sum of the observed reading} \\ \qquad\qquad \text{of the zenith-distance micrometer} \\ \qquad\qquad + 0^{r}.250. \end{array}\right\}$$

The values of the division and flexure corrections are found by means of the formulæ for reflection observations in Tables V to VIII. The constant added to the reduction to the meridian is 1″.80. In the terms relating to the micrometer microscopes, the upper signs are to be taken when the clamp is east and the lower when it is west.

The value of the first term in the expression for the zenith-point correction is a constant, and, in 1877, the different terms were obtained as follows:

In 1877 the clamp was east; circle B was used; the reading of the horizontal microscope, when the telescope was pointed to the zenith, was 45°.1 $= R_0$ and the distance of the nadir point from the reflected pole was 51°.1 $= \Delta$. With these data, Table VI gives 45°.1 as the argument with which to enter Table V to find the division correction — 0″.01. With the same data, Table VII gives the correction for circle flexure + 0″.02; and Table VIII gives the correction for flexure of telescope — 0″.29 Hence, the

	°	′	″
Nadir contsant is - - - - - - - - - - -	180	0	0.00
Correction for errors of division is - - - -		—	0.01
Correction for flexure of circle is - - - - -		+	0.02
Correction for flexure of telescope is - - - -		—	0.29
Constant added to reduction to meridian is - -		—	1.80
	179	59	57.92

The second term is simply the concluded circle reading when the clamp is east.

The correction $+0^{r}.250$ to the reading of the zenith-distance micrometer is necessary, because the head of that micrometer has four indexes, and the one used in the nadir observation reads $0^{r}.250$ less than that employed in other observations.

The adopted zenith-point corrections used in the reductions in 1877 will be found in Table E of this Introduction. These corrections were obtained, as in 1876, by combining the results from nadir and reflection observations. The nadir observations were made in the usual way, and the divisions of circle B, on which the readings were actually made, were:

	°	′
For microscope I	180	4
For microscope II	270	4
For microscope III	0	4
For microscope IV	90	4

The microscopes were read both *before* and *after* the nadir observation, and the mean of these readings was adopted as the true reading.

From January 1 to August 4 *seventy-nine* observations, *direct* and *reflected* at the same transit, were made of stars *south* of the zenith and *ninety-five* of stars *north* of the zenith. The mean of the differences between the zenith-point corrections derived from observations of the nadir and of stars was, for southern stars Nadir — S. = + 0″.10; for northern stars = + 0″.81. After August 4, when the eye-piece was removed, *thirty-two* observations were made of *southern* stars and *thirty-five* of northern stars. The mean of the differences between the zenith-point corrections derived from observations of the nadir and the stars was, for *southern* stars Nadir — S = — 0″.28, and for northern stars Nadir — S. = + 0″.62. An examination of these results by groups does not indicate any change in the correction Nadir — S., depending on the zenith-distance.

Whenever nadir observations alone were made, the unmodified results were used as the zenith-point corrections. When corrections were obtained from both nadir and star observations, or from star observations alone, the values from stars were corrected by the above values of Nadir — S., and the mean of all corrections obtained during a day or evening was adopted; giving equal weight to each value.

RESULTS OF OBSERVATIONS WITH THE TRANSIT CIRCLE.

In former volumes, from 1866 to 1876, inclusive, it has been the custom to print the observations with the Transit Circle in detail, but with this volume it has been deemed advisable, for many reasons, to change the system and to print only the *results* of the observations and reductions.

These results will be found on pages 1 to 95.

RIGHT ASCENSIONS.

The *first* column contains the day of the observation, which begins with the transit of the sun. It also contains the initial of the observer, as follows:

E.—Professor J. R. Eastman, U. S. N.
F.—Assistant Edgar Frisby.
S.—Assistant A. N. Skinner.
P.—Assistant H. M. Paul.

The *second* column contains the reference number.

The *third* column contains the name of the object. In the case of the sun, moon, and planets, the part observed is always specified; I and II indicating respectively the preceding and following limbs; N. and S., the north and south limbs; and C., the center. When one component of a double star is observed, it is always the brighter of the two, unless otherwise designated.

The *fourth* column contains the number of threads over which transits were observed and used in the reductions.

The *fifth* column contains the clock time of transit over the "mean thread," whose position is the mean of the standard set of nine threads. When stars are observed over other or less threads than the standard set, the recorded transit over each thread is reduced to the "mean thread" by means of the known thread intervals.

In the case of other objects, the reduction for each thread is corrected for the motion of the object during the interval between each thread and the "mean thread."

The *sixth* column contains the sum of the instrumental corrections, or the quantity

$$Aa + Bb + Cc$$

where a, b, c are the constants, and A, B, C are the factors for azimuth, level, and collimation.

The formulæ for computing A, B, and C are:

$$A = \sin(\varphi - \delta) \sec \delta = \sin \varphi - \cos \varphi \tan \delta$$
$$B = \cos(\varphi - \delta) \sec \delta = \cos \varphi + \sin \varphi \tan \delta$$
$$C = \sec \delta$$

in which φ is the latitude of the Observatory, and δ is the declination of the object observed.

The reductions of transit observations with the Transit Circle are made by means of tables giving the values of Aa, Bb, and Cc for each degree of zenith distance, and for each $0^s.01$ of the constants a, b, c, from $0^s.01$ to $0^s.50$. These tables may be found in Appendix I to the Washington Observations for 1872.

A general table of the values of the factors A, B, and C may be found on page xlvii of the Introduction to the Transit Circle in 1873.

Table B, following this introduction, contains the adopted values of the instrumental constants for all occasions on which observations were made. The first column gives the mean date to the nearest tenth of a day. The second column gives the sidereal hour to the nearest tenth, for which the constants were computed or observed. The third, fourth, and fifth columns contain respectively the adopted value of the collimation, level, and azimuth constants.

The *seventh* column contains the *apparent* and the *adopted* clock corrections. The apparent clock corrections are in full-faced type, and are derived from direct observations of stars of the American Ephemeris within 40° of the equator.

The adopted apparent right ascensions of these stars were obtained by applying the corrections given in Table C to the apparent right ascension of the American Ephemeris.

The clock corrections in the seventh column, printed in ordinary type, are derived from the data in Table D.

The principal work of the Transit Circle in 1877 has been upon the sun, moon, and planets and miscellaneous stars, and it has been deemed unadvisable to attempt the determination of corrections in right ascension to the star-places of the American

Ephemeris, as was done before 1876. Accordingly in 1877, only such stars of the American Ephemeris were observed as were required to determine clock corrections and rates, and instrumental corrections. Whenever possible, at least three stars were observed for clock corrections near the beginning and also near the end of the observing period on each day and each night. The mean of the corrections in each group was assumed to correspond with the mean of the times, and the hourly rate was determined for the period that the clock was in actual use. The corrections and rates are found in Table D, which requires no explanation.

By this method, the personal equation of the observer was seldom involved, but it was determined as usual with the apparatus described in the volume for 1875, and the correction is given below with the proper sign for application to the observed time.

	s.
Professor EASTMAN - - - - - - - - - - -	— 0.115
Assistant FRISBY - - - - - - - - - - - -	— 0.035
Assistant SKINNER - - - - - - - - - - -	+ 0.079
Assistant PAUL - - - - - - - - - - - - -	— 0.199

The *eleventh* column contains the apparent right ascension of each object, or the sum of the fifth, sixth, and seventh columns, and in all cases has reference to that part of the object which was actually observed.

The *twelfth* column contains,

(1) The corrections given by each observation to the right ascension of the stars of the American Ephemeris, given simply to show the general accordance of the observations.

(2) The reduction for all other stars to their mean position for the fictitious epoch 1877.0. This reduction is computed with the constants of the American Ephemeris, and no proper motion is applied.

(3) The sidereal time of the semi-diameter of the sun, the moon, or a planet passing the meridian, when only one limb is observed, as given in the American Ephemeris. In the case of the sun, the Ephemeris time has been corrected for the personal equation of the observer, which was determined from all the observations of the year.

NORTH POLAR DISTANCE.

The *eighth* column contains the zenith-distance *south* of each object observed, as derived from circles A and B. This quantity, when the clamp is *east*, is equal to the reading of the horizontal microscope of circle A, minus the excess of the mean of the readings of the micrometer microscopes of circle B above *ten* revolutions. When the clamp is *west*, it is equal to 359° 52′, minus the reading of the horizontal microscope of circle A, plus the excess of the mean of the readings of the micrometer microscopes of circle B, above *ten* revolutions.

The *ninth* column contains

(1) The micrometer equivalent.
(2) The reduction to the meridian.
(3) The correction for inclination of threads and motion of object.
(4) The correction for the thread employed in the bisections.
(5) The zenith-point correction.

(1) The micrometer equivalent of the readings of the zenith-distance micrometer, if the clamp is east, is

$$2'\ 0''.0 + R\ (40^{r}.000 - r)$$

if the clamp is west, it is

$$4'\ 0''.0 - R\ (40^{r}.000 - r)$$

In these formulæ r is the mean of the readings of the zenith-distance micrometer, expressed in revolutions; R, the mean value of one revolution between r and 40.0 revolutions, and the numerical term is a constant added to make the zenith-point correction always positive.

In practice, the micrometer equivalents are taken from a table where the values are tabulated for each $0^{r}.01$ from $24^{r}.3$ to $47^{r}.8$.

Two bisections of each object observed were usually made with the declination micrometer. When, for any reason, any other number of bisections were made, the fact is noted at the foot of the page.

(2) The reduction to the meridian is computed from the formula

$$\mu = 1''.80 - 112.5 \sin 1''\ i^2 \tan \delta$$
$$= 1''.80 - [6.7367]\ i^2 \tan \delta$$

where μ is the reduction to the meridian, in seconds of arc; i, the equatorial interval, in seconds of time, between the mean thread and the thread at which the bisection was made; δ, the declination of the object; and $1''.80$ is a constant introduced to make μ generally positive. The values of μ are tabulated for all the vertical threads and for each degree of declination.

Where bisections are made away from the vertical threads, the time of the bisection is noted, and the correction is computed from the formula

$$\mu = 1''.80 - [6.4357]\ I^2 \sin 2\delta$$

where I represents the distance of the object from the meridian at the time of bisection, and the other terms are the same as before.

(3) The corrections for inclination of threads given on pages XXVIII and 3 were derived from a large number of observations at threads I and VII; and the correction for motion of object in unsymmetrical observations is computed from the formula

$$\varDelta' = \frac{\varDelta}{3600} I$$

where $\varDelta'$ is the correction for motion, and $\varDelta$ the hourly motion of the object in declination, both expressed in seconds of arc; I is the interval, in seconds of time, between the mean thread and the thread at which the bisection was made.

(4) In observations where threads A or B were employed, the correction for the distance of the thread from the central pair of threads was required, and the value of this correction is found on pages XXVIII and 3.

(5) The zenith-point correction is taken directly from Table E, and it is also given for each date at the bottom of each page.

The sum of the quantities in columns *eight* and *nine* give the apparent zenith-distance south.

The *tenth* column contains the correction for refraction computed from Bessel's formula, employing the tables given in the Appendix to the Washington Observations for 1845.

The *thirteenth* column contains the apparent north polar distance of each object, or the adopted co-latitude, 51° 6′ 21″.2 ± the sum of the apparent zenith distance south, and the refraction. The upper sign is employed for a direct, and the lower for a reflected observation.

The *fourteenth* column contains:

(1) For stars whose apparent positions are given in the American Ephemeris, the correction to the north polar distance of the Ephemeris obtained from each observation.

(2) For other stars, the reduction to their mean position for the fictitious epoch 1877.0. This reduction is computed with the constants of the American Ephemeris, and no proper motion is applied.

(3) For the asteroids, the correction for parallax, computed from the data accompanying the ephemerides.

The corrections for parallax, semi-diameter, and defective illumination for the sun, moon, and larger planets are given at the foot of the pages containing the observations.

The readings of the barometer, the attached thermometer, and the external thermometer are given at the foot of each page.

All corrections for parallax, except those for the asteroids, are computed from the data contained in the American Ephemeris. When both limbs of an object were observed, the semi-diameter is derived from the observation; but, when only one limb was observed, the semi-diameter is taken from the American Ephemeris.

The corrections for defective illlumination are computed from the data of the American Ephemeris.

CORRECTIONS TO THE STAR-POSITIONS OF THE AMERICAN EPHEMERIS IN NORTH POLAR DISTANCE, GIVEN BY INDIVIDUAL OBSERVATIONS WITH THE TRANSIT CIRCLE IN 1877.

The tables containing these corrections may be found on pages 241 to 256, and give the date of the observation, the initial of the observer, and the correction for each observation in north polar distance, copied without change, except for erroneous micrometer revolutions, from the last column of the pages of the observations.

An interrogation mark signifies that the result is doubtful, and an *r*, that it is rejected in the determination of the adopted mean result.

The mean polar distances thus found still require the following corrections:

(1) For errors of division;
(2) For flexure;
(3) For error in zenith-point correction;
(4) For error in assumed latitude.

Errors of division.—The corrections for errors of division of circle B were determined in November and December, 1865. These corrections are given in the following table,[1] which contains the correction to be applied to the mean of the readings of the four microscopes in order to free this mean from the effect of errors of division. The argument with which to enter the table is the reading of the horizontal microscope at circle B.

TABLE IV.—*Corrections for Errors of Division to be applied to the Mean of the Readings of the Four Micrometer Microscopes of Circle B.*

Arg.	Correction.	Arg.	Correction.	Arg.	Correction.	Arg.	Correction.	Arg.	Correction.
°	″	°	″	°	″	°	″	°	″
0	+ 0.30	18	+ 0.57	36	+ 0.12	54	+ 0.14	72	+ 0.27
1	+ 0.23	19	+ 0.52	37	+ 0.15	55	+ 0.15	73	+ 0.28
2	+ 0.18	20	+ 0.48	38	+ 0.14	56	+ 0.16	74	+ 0.31
3	+ 0.18	21	+ 0.49	39	+ 0.08	57	+ 0.17	75	+ 0.35
4	+ 0.22	22	+ 0.52	40	+ 0.02	58	+ 0.19	76	+ 0.40
5	+ 0.27	23	+ 0.53	41	− 0.07	59	+ 0.20	77	+ 0.45
6	+ 0.27	24	+ 0.50	42	− 0.12	60	+ 0.22	78	+ 0.46
7	+ 0.26	25	+ 0.46	43	− 0.13	61	+ 0.26	79	+ 0.45
8	+ 0.26	26	+ 0.44	44	− 0.07	62	+ 0.28	80	+ 0.44
9	+ 0.27	27	+ 0.42	45	− 0.01	63	+ 0.27	81	+ 0.41
10	+ 0.29	28	+ 0.40	46	0.00	64	+ 0.25	82	+ 0.38
11	+ 0.29	29	+ 0.34	47	0.00	65	+ 0.22	83	+ 0.36
12	+ 0.29	30	+ 0.27	48	0.00	66	+ 0.22	84	+ 0.36
13	+ 0.36	31	+ 0.24	49	+ 0.06	67	+ 0.22	85	+ 0.36
14	+ 0.44	32	+ 0.22	50	+ 0.12	68	+ 0.22	86	+ 0.40
15	+ 0.52	33	+ 0.19	51	+ 0.12	69	+ 0.23	87	+ 0.44
16	+ 0.56	34	+ 0.15	52	+ 0.12	70	+ 0.24	88	+ 0.44
17	+ 0.57	35	+ 0.11	53	+ 0.13	71	+ 0.25	89	+ 0.37

The corrections in this table are only applicable when the microscopes are 90° apart, and their supporting arms make an angle of 45° with the vertical.

The following table gives the argument, in all cases, with which to enter Table IV to obtain the division correction which must be applied to an observed north polar distance. In this table, R_0 is the reading of the horizontal microscope at circle B when the telescope points to the zenith; Δ is the observed north polar distance of the object, and the last column indicates the use of the sign of the correction in Table IV.

The argument will, of course, be brought into the first quadrant.

TABLE V.

Clamp.	Observation.	Argument.	Sign of Correction.
		°	
East	Direct	$R_0 + 51.1 - \Delta$	Changed
	Reflected	$R_0 + 38.9 + \Delta$	Same
West	Direct	$R_0 + 38.9 + \Delta$	Same
	Reflected	$R_0 + 51.1 - \Delta$	Changed

---

[1] Washington Observations for 1865, Description of Transit Circle, § 72.

Flexure.—The correction to an observed circle reading for flexure of circle[1] is, for circle B, $+0''.84 \sin R - 0''.86 \cos R$, where R is the reading of the horizontal microscope when the telescope is pointed to the object. Changing the expression for the correction for flexure of circle, so that the correction will be a function of the north polar distance, we have the following table for circle B:

TABLE VI.

Clamp.	Observation.	Correction.
		$''$ $\qquad\qquad$ $^\circ$
East	Direct	$-1.20 \sin (R_0 + 5.4 - \Delta)$
	Reflected	$+1.20 \sin (R_0 + 83.2 + \Delta)$
West	Direct	$+1.20 \sin (R_0 + 263.2 + \Delta)$
	Reflected	$-1.20 \sin (R_0 + 185.4 - \Delta)$

where the quantities have the same significance as in Table V.

From observations[2] made in 1872 and 1873, the following formulæ were obtained for determining the correction to be applied to an observed north polar distance for the effect of flexure of telescope and curvature of level for circle B:

TABLE VII.

Clamp.	Observation.	Correction.
		$''$ $\qquad\qquad$ $^\circ$
East	Direct	$-0.95 \sin (\Delta - 33.3)$
	Reflected	$+1.10 \sin (\Delta - 66.4)$
West	Direct	$-0.95 \sin (\Delta - 68.9)$
	Reflected	$+1.10 \sin (\Delta - 35.8)$

The correction for constant error in the zenith-point is obtained from a comparison of the direct and reflected observations in 1877. Observations were not used in this discussion except when the star was observed direct and reflected at the same transit.

The method of obtaining the value of this correction is shown in Table VIII, where the results of the observations are collected. In this table, the first column contains the names of all the stars observed by reflection in 1877. The second column contains the right ascension to the nearest tenth of an hour. The third column contains the mean values of the north polar distances given by direct observations; and the fourth column contains the seconds of the mean values obtained from reflected observations. The small subscript figures indicate the number of observations made on each star. The fifth column contains the difference between the direct and reflected observations. The sixth column contains the corrections which must be applied to the quantities in the fifth column on account of the errors of graduation and flexure of telescope and circle. The seventh column contains the sums of the quantities in the fifth and sixth columns.

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[1] Washington Observations, 1865, Description of Transit Circle, § 61

[2] Introduction to Transit Circle, Washington Observations, 1872, page lxiv.

The eighth column contains the weights of the values of $2\,\Delta Z$ in the seventh column. As there are the same number of observations reflected as direct the weight assigned is simply the square root of the number of observations.

The ninth column contains the products of the quantities in the seventh column by their respective weights, and the final results are:

From observations north of the zenith - - - - $\Delta Z = +0''.78$
From observations south of the zenith - - - - $\Delta Z = -\ 0.01$

TABLE VIII.—*Computation of the Value of ΔZ from the Observations in* 1877.

NORTHERN STARS.

Name of Star.	α	Observed N. P. Distance.		D. – R.	Corr. to D. – R.	$2\Delta Z$	p	$2p\Delta Z$
		Direct.	Reflected.					
	h.	° ′ ″	″	″	″	″		″
51 Cephei	6.7	2 46 3.63$_1$	1.63	+ 2.00	– 0.95	+ 1.05	1.00	+ 1.05
1 Draconis	9.3	8 7 60.04$_1$	56.14	+ 3.90	– 0.90	+ 3.00	1.00	+ 3.00
23 (H.) Camelopardalis .	6.4	10 18 30.80$_1$	28.90	+ 1.90	– 0.92	+ 0.98	1.00	+ 0.98
4 Draconis	12.1	11 41 62.24$_2$	59.74	+ 2.50	– 0.90	+ 1.60	1.41	+ 2.26
ζ Ursæ Minoris . .	15.8	11 49 43.94$_2$	41.49	+ 2.45	– 0.90	+ 1.55	1.41	+ 2.19
κ Cephei	20.2	12 39 36.96$_1$	34.56	+ 2.40	– 0.89	+ 1.51	1.00	+ 1.51
γ Cephei	23.6	13 3 15.80$_1$	13.00	+ 2.80	– 0.89	+ 1.91	1.00	+ 1.91
9 Draconis	10.4	13 39 17.93$_2$	15.08	+ 2.85	– 0.89	+ 1.96	1.41	+ 2.76
226 Cephei	22.5	14 24 26.96$_1$	25.26	+ 1.70	– 0.91	+ 0.79	1.00	+ 0.79
β Ursæ Minoris . .	14.9	15 20 31.41$_2$	29.66	+ 1.75	– 0.95	+ 0.80	1.41	+ 1.13
τ Draconis	19.3	16 52 26.86$_1$	22.86	+ 4.00	– 0.97	+ 3.03	1.00	+ 3.03
γ^2 Ursæ Minoris . .	15.3	17 41 42.70$_3$	40.90	+ 1.80	– 0.98	+ 0.82	1.73	+ 1.42
50 Cassiopeæ . . .	1.9	18 10 31.83$_2$	29.68	+ 2.15	– 0.99	+ 1.16	1.41	+ 1.64
κ Draconis	12.5	19 32 1.51$_1$	0.61	+ 0.90	– 1.05	– 0.15	1.00	– 0.15
λ Draconis	11.4	19 59 27.80$_1$	25.20	+ 2.60	– 1.07	+ 1.53	1.00	+ 1.53
β Cephei	21.5	19 58 45.14$_1$	42.94	+ 2.20	– 1.07	+ 1.13	1.00	+ 1.13
B. A. C. 3652 . . .	10.6	20 16 54.05$_2$	50.10	+ 3.95	– 1.08	+ 2.87	1.41	+ 4.05
B. A. C. 2439 . . .	7.3	21 17 12.65$_2$	8.15	+ 4.50	– 1.10	+ 3.40	1.41	+ 4.79
ο Cephei	23.2	22 33 42.20$_1$	40.80	+ 1.40	– 1.07	+ 0.33	1.00	+ 0.33
δ Draconis	19.2	22 33 19.44$_3$	16.31	+ 3.13	– 1.07	+ 2.06	1.73	+ 3.56
ι Cassiopeæ . . .	2.3	23 9 10.58$_1$	6.28	+ 4.30	– 1.06	+ 3.24	1.00	+ 3.24
32 Ursæ Majoris . .	10.2	24 16 45.37$_2$	43.02	+ 2.35	– 1.02	+ 1.33	1.41	+ 1.88
α Draconis	14.0	25 2 11.31$_1$	7.11	+ 4.20	– 0.96	+ 3.24	1.00	+ 3.24
B. A. C. 6905 . . .	20.0	25 31 25.00$_1$	22.90	+ 2.10	– 0.93	+ 1.17	1.00	+ 1.17
α Ursæ Majoris . .	10.9	27 35 8.93$_7$	6.02	+ 2.91	– 0.90	+ 2.01	2.65	+ 5.33
B. A. C. 126 . . .	0.4	27 44 50.60$_1$	48.20	+ 2.40	– 0.90	+ 1.50	1.00	+ 1.50
α Cephei	21.3	27 56 7.66$_5$	5.26	+ 2.40	– 0.91	+ 1.49	2.24	+ 3.34
B. A. C. 7220 . . .	20.7	28 38 19.30$_3$	17.77	+ 1.53	– 0.91	+ 0.62	1.73	+ 1.07
B. A. C. 2819 . . .	8.3	28 52 24.38$_4$	20.70	+ 3.68	– 0.91	+ 2.77	2.00	+ 5.54
B. A. C. 1536 . . .	4.9	29 44 27.40$_1$	22.60	+ 4.80	– 0.89	+ 3.91	1.00	+ 3.91
B. A. C. 253 . . .	0.8	29 56 60.50$_3$	58.33	+ 2.17	– 0.88	+ 1.29	1.73	+ 2.23
B. A. C. 1849 . . .	5.7	30 8 36.05$_2$	32.30	+ 3.75	– 0.87	+ 2.88	1.41	+ 4.06
B. A. C. 5348 . . .	16.0	31 6 22.45$_2$	19.85	+ 2.60	– 0.83	+ 1.77	1.41	+ 2.50
B. A. C. 8268 . . .	23.7	32 1 60.63$_3$	57.93	+ 2.70	– 0.82	+ 1.88	1.73	+ 3.25
B. A. C. 4123 . . .	12.2	32 17 4.10$_1$	0.20	+ 3.90	– 0.82	+ 3.08	1.00	+ 3.08

TABLE VIII.—*Computation of the Value of ΔZ from the Observations in* 1877—Cont'd.

NORTHERN STARS—Continued.

Name of Star.	a	Observed N. P. Distance.		D. − R.	Corr. to D. − R.	$2\Delta Z$	p	$2p\Delta Z$
		Direct.	Reflected.					
	h.	° ′ ″	″	″	″	″		″
B. A. C. 5643 . . .	16.7	32 59 52.70₁	51.10	+ 1.60	− 0.82	+ 0.78	1.00	+ 0.78
B. A. C. 7643 . . .	21.8	33 58 15.50₂	14.00	+ 1.50	− 0.81	+ 0.69	1.41	+ 0.97
α Cassiopeæ . . .	0.6	34 8 16.73₄	14.63	+ 2.10	− 0.81	+ 1.29	2.00	+ 2.58
B. A. C. 863 . . .	2.7	34 36 60.65₂	59.60	+ 1.05	− 0.75	+ 0.30	1.41	+ 0.42
B. A. C. 4568 . . .	13.6	34 41 45.30₁	43.00	+ 2.30	− 0.75	+ 1.55	1.00	+ 1.55
γ Ursæ Majoris . .	11.8	35 37 18.67₆	16.17	+ 2.50	− 0.65	+ 1.85	2.24	+ 4.14
β Draconis	17.5	37 36 26.43₁	25.83	+ 0.60	− 0.52	+ 0.08	1.00	+ 0.08
B. A. C. 2697 . . .	8.0	38 8 29.30₂	27.85	+ 1.45	− 0.51	+ 0.94	1.41	+ 1.33
γ Draconis	17.9	38 29 46.54₉	44.92	+ 1.62	− 0.48	+ 1.14	3.00	+ 3.42
B. A. C. 79 . . .	0.3	38 39 44.35₂	43.10	+ 1.25	− 0.47	+ 0.78	1.41	+ 1.10
B. A. C. 6734 . . .	19.6	40 3 48.30₁	47.20	+ 1.10	− 0.39	+ 0.71	1.00	+ 0.71
η Ursæ Majoris . .	13.7	40 4 21.23₇	19.75	+ 1.48	− 0.39	+ 1.09	2.65	+ 2.89
α Persei	3.3	40 24 43.86₆	41.78	+ 2.08	− 0.37	+ 1.71	2.24	+ 3.83
B. A. C. 962 . . .	3.0	40 51 31.15₂	28.70	+ 2.45	− 0.33	+ 2.12	1.41	+ 2.99
ι Ursæ Majoris . .	8.8	41 28 38.66₃	36.56	+ 2.10	− 0.33	+ 1.77	1.73	+ 3.06
B. A. C. 3981 . . .	11.7	41 32 19.90₁	19.30	+ 0.60	− 0.33	+ 0.27	1.00	+ 0.27
B. A. C. 2609 . . .	7.8	42 7 8.40₆	7.27	+ 1.13	− 0.33	+ 0.80	2.45	+ 1.96
δ Persei	3.6	42 36 28.00₂	26.90	+ 1.10	− 0.32	+ 0.78	1.41	+ 1.10
α Aurigæ	5.1	44 7 47.89₁	44.79	+ 3.10	− 0.29	+ 2.81	2.00	+ 5.62
α Cygni	20.6	45 9 31.38₄	29.83	+ 1.55	− 0.24	+ 1.31	2.00	+ 2.62
								$\Delta Z = +0''.78$

TABLE VIII.—*Computation of the Value of ΔZ from the Observations in* 1877—Cont'd.

SOUTHERN STARS.

Name of Star.	α	Observed N. P. Distance. Direct.	Observed N. P. Distance. Reflected.	D.— R.	Corr. to D. — R.	$2\Delta Z$	p	$2p\Delta Z$
	h.	° ′ ″	″	″	″	″		″
B. A. C. 3851	11.2	57 46 45.80_1	45.60	+ 0.20	− 0.18	+ 0.02	1.00	+ 0.02
B. A. C. 7029	20.3	58 12 22.60_1	21.90	+ 0.70	− 0.19	+ 0.51	1.00	+ 0.51
ρ Bootis	14.4	59 5 17.30_1	16.20	+ 1.10	− 0.22	+ 0.88	1.00	+ 0.88
B. A. C. 166	0.5	59 48 44.00_1	44.40	− 0.40	− 0.19	− 0.59	1.00	− 0.59
ζ Cygni	21.1	60 16 37.23_2	36.18	+ 1.05	− 0.18	+ 0.87	1.41	+ 1.23
B. A. C. 7923	22.6	60 25 17.30_1	17.20	+ 0.10	− 0.18	− 0.08	1.00	− 0.08
B. A. C. 569	1.8	61 1 15.50_1	18.50	− 3.00	− 0.18	− 3.18	1.00	− 3.18
B. A. C. 4195	12.3	61 2 53.05_2	52.10	+ 0.95	− 0.18	+ 0.77	1.41	+ 1.09
β Tauri	5.3	61 29 55.26_2	54.41	+ 0.85	− 0.19	+ 0.66	1.41	+ 0.93
α Andromedæ	0.0	61 35 19.51_3	19.18	+ 0.33	− 0.20	+ 0.13	1.73	+ 0.22
B. A. C. 6690	19.4	62 17 51.65_2	52.20	− 0.55	− 0.22	− 0.77	1.41	− 1.09
ϵ Bootis	14.7	62 24 23.28_1	23.28	0.00	− 0.23	− 0.23	1.00	− 0.23
B. A. C. 8032	23.0	62 35 3.10_1	1.30	+ 1.80	− 0.23	+ 1.57	1.00	+ 1.57
ϵ Coronæ Borealis	15.9	62 45 54.02_1	54.72	− 0.70	− 0.24	− 0.94	1.00	− 0.94
α Coronæ Borealis	15.5	62 52 13.92_3	13.42	+ 0.50	− 0.25	+ 0.25	1.73	+ 0.43
B. A. C. 3742[1]	10.8	64 35 40.47_3	41.07	− 0.60	− 0.32	− 0.92	1.73	− 1.59
B. A. C. 2194	6.6	64 44 55.90_1	56.90	− 1.00	− 0.32	− 1.32	1.00	− 1.32
ϵ Leonis	9.6	65 39 37.58_1	36.58	+ 1.00	− 0.35	+ 0.65	1.00	+ 0.65
η Tauri	3.7	66 16 36.94_3	36.04	+ 0.90	− 0.40	+ 0.50	1.73	+ 0.86
α Arietis	2.0	67 7 13.11_2	12.26	+ 0.85	− 0.47	+ 0.38	1.41	+ 0.54
δ Geminorum	7.2	67 47 35.54_1	33.44	+ 2.10	− 0.52	+ 1.58	1.00	+ 1.58
β Herculis	16.4	68 14 28.10_1	28.80	− 0.70	− 0.54	− 1.24	1.00	− 1.24
δ Leonis	11.1	68 48 9.92_2	10.22	− 0.30	− 0.54	− 0.84	1.41	− 1.18
B. A. C. 1767	5.5	68 56 5.10_1	4.20	+ 0.90	− 0.55	+ 0.35	1.00	+ 0.35
η Cancri	8.4	69 8 33.90_1	32.80	+ 1.10	− 0.55	+ 0.55	1.00	+ 0.55
B. A. C. 2305	6.9	69 15 5.00_1	3.40	+ 1.60	− 0.55	+ 1.05	1.00	+ 1.05
ζ Arietis	3.1	69 24 46.26_1	46.76	− 0.50	− 0.55	− 1.05	1.00	− 1.05
β Arietis	1.8	69 47 37.32_1	39.22	− 1.90	− 0.54	− 2.44	1.00	− 2.44
B. A. C. 1939	5.9	69 51 39.40_2	38.25	+ 1.15	− 0.54	+ 0.61	1.41	+ 0.86
α Bootis	14.2	70 10 35.76_5	35.20	+ 0.56	− 0.54	+ 0.02	2.24	+ 0.04
B. A. C. 4905[2]	14.8	70 23 16.15_2	16.55	− 0.40	− 0.54	− 0.94	1.41	− 1.33
B. A. C. 5466	16.3	70 33 26.00_1	24.40	+ 1.60	− 0.52	+ 1.08	1.00	+ 1.08
1 Pegasi	21.3	70 43 15.43_1	15.93	− 0.50	− 0.52	− 1.02	1.00	− 1.02
γ Geminorum	6.5	73 29 51.82_1	52.22	− 0.40	− 0.58	− 0.98	1.00	− 0.98
α Tauri	4.5	73 44 24.74_1	23.84	+ 0.90	− 0.56	+ 0.34	1.00	+ 0.34
B. A. C. 5216	15.7	74 11 31.40_1	32.30	− 0.90	− 0.56	− 1.46	1.00	− 1.46
β Leonis	11.7	74 44 25.92_1	26.02	− 0.10	− 0.56	− 0.66	1.00	− 0.66
γ Tauri	4.2	74 40 15.20_1	15.50	− 0.30	− 0.56	− 0.86	1.00	− 0.86
11 Orionis	5.0	74 46 9.30_2	7.45	+ 1.85	− 0.55	+ 1.30	1.41	+ 1.83
η Piscium	1.4	75 17 20.17_2	20.22	− 0.05	− 0.54	− 0.59	1.41	− 0.83

TABLE VIII.—*Computation of the Value of ΔZ from the Observations in* 1877—Cont'd.

SOUTHERN STARS—Continued.

Name of Star.	α	Observed N. P. Distance.		D. − R.	Corr. to D. − R.	$2\Delta Z$	p	$2p\Delta Z$
		Direct.	Reflected.					
	h.	° ′ ″	″	″	″	″		″
γ Pegasi	0.1	75 30 2.01_2	1.06	+ 0.95	− 0.54	+ 0.41	1.41	+ 0.58
α^1 Herculis	17.2	75 28 5.83_1	5.23	+ 0.60	− 0.54	+ 0.06	1.00	+ 0.06
ζ Aquilæ.	19.0	76 19 5.55_2	4.70	+ 0.85	− 0.54	+ 0.31	1.41	+ 0.44
α Leonis	10.0	77 25 56.47_2	57.04	− 0.57	− 0.60	− 1.17	1.41	− 1.65
l Leonis	10.7	78 48 17.14_3	16.40	+ 0.74	− 0.64	+ 0.10	1.73	+ 0.17
B. A. C. 3877 . . .	11.3	78 47 37.00_1	35.60	+ 1.40	− 0.64	+ 0.76	1.00	+ 0.76
ε Delphini	20.5	79 6 49.90_3	49.60	+ 0.30	− 0.64	− 0.34	1.73	− 0.59
γ Aquilæ	19.7	79 41 7.83_1	6.63	+ 1.20	− 0.64	+ 0.56	1.00	+ 0.56
κ Ophiuchi	16.9	80 25 58.43_1	56.43	+ 2.00	− 0.66	+ 1.34	1.00	+ 1.34
B. A. C. 2778 . . .	8.2	80 26 14.35_2	12.80	+ 1.55	− 0.66	+ 0.89	1.41	+ 1.25
υ Virginis	12.0	80 35 2.35_3	2.08	+ 0.27	− 0.65	− 0.38	1.73	− 0.66
ο Piscium	1.6	81 27 43.31_1	44.01	− 0.70	− 0.65	− 1.35	1.00	− 1.35
α Aquilæ	19.7	81 27 19.17_1	18.07	+ 1.10	− 0.65	+ 0.45	1.00	+ 0.45
ξ^1 Ceti	2.1	81 43 52.22_1	51.72	+ 0.50	− 0.64	− 0.14	1.00	− 0.14
α Orionis	5.8	82 37 4.85_2	3.70	+ 1.15	− 0.60	+ 0.55	1.41	+ 0.78
α Serpentis	15.6	83 11 10.90_3	10.73	+ 0.17	− 0.57	− 0.40	1.73	− 0.69
B. A. C. 2901 . . .	8.5	83 52 7.80_1	7.30	+ 0.50	− 0.53	− 0.03	1.00	− 0.03
α Canis Minoris . .	7.5	84 27 40.47_1	40.57	− 0.10	− 0.50	− 0.60	1.00	− 0.60
ι Piscium	23.6	85 2 24.25_2	24.70	− 0.45	− 0.49	− 0.94	1.41	− 1.33
B. A. C. 3146 . . .	9.1	87 10 5.10_4	4.08	+ 1.02	− 0.40	+ 0.62	2.00	+ 1.24
γ Ceti	2.6	87 17 0.02_1	0.72	− 0.70	− 0.40	− 1.10	1.00	− 1.10
B. A. C. 4002 . . .	11.7	87 32 32.90_1	31.80	+ 1.10	− 0.38	+ 0.72	1.00	+ 0.72
B. A. C. 1514 . . .	4.8	87 45 46.20_1	43.60	+ 2.60	− 0.38	+ 2.22	1.00	+ 2.22
B. A. C. 4672 . . .	13.9	87 51 34.40_1	33.40	+ 1.00	− 0.37	+ 0.63	1.00	+ 0.63
η Virginis	12.2	89 58 59.34_1	59.64	− 0.30	− 0.35	− 0.65	1.00	− 0.65
B. A. C. 3303 . . .	9.6	90 35 8.40_1	7.10	+ 1.30	− 0.35	+ 0.95	1.00	+ 0.95
B. A. C. 4268^1 . . .	12.6	90 46 32.30_1	31.90	+ 0.40	− 0.35	+ 0.05	1.00	+ 0.05
B. A. C. 5437^1 . . .	16.2	94 23 29.10_1	27.30	+ 1.80	− 0.31	+ 1.49	1.00	+ 1.49
12 Ceti	0.4	94 38 14.60_1	13.50	+ 1.10	− 0.29	+ 0.81	1.00	+ 0.81
λ Aquarii	22.8	98 14 0.26_1	0.86	− 0.60	− 0.29	− 0.89	1.00	− 0.89
ξ Aquarii	21.5	98 24 17.96_1	18.46	− 0.50	− 0.29	− 0.79	1.00	− 0.79
θ Aquarii	22.2	98 23 42.14_2	42.49	− 0.35	− 0.29	− 0.64	1.41	− 0.90
								$\Delta Z = -0''.01$

The correction for error of assumed latitude is derived from a comparison of the observations of the same stars, both above and below the pole. Table IX exhibits the method of obtaining the value of the correction, $\Delta\varphi$. The sixth column contains the sum of the corrections for the errors of division, flexure, and assumed zenith point.

The *eighth* column contains the weights of the values of $2\,\Delta\varphi$ in the *seventh* column. The weights are computed by the formula

$$p = \frac{12\,mn}{2\,mn + 11\,(m+n)}$$

where p is the weight; m, the number of observations above the pole, and n, the number of observations below the pole.

The other columns will require no explanation.

From this table, it is found that $\Delta\varphi = -0''.44$.

TABLE IX.—*Computation of the Value of $\Delta\varphi$ from the Observations made in* 1877.

Name of Star.	a	Observed N. P. Distance. Culmination— Upper.	Lower.	U. + L. − 360°	Corr. to U. + L. − 360°	$2\,\Delta\varphi$	p	$2p\Delta\varphi$
	h.	° ′ ″	″	″	″	″		″
λ Ursæ Minoris	19.8	1 3 51.73_{11}	11.07_{9}	+ 2.80	− 2.90	− 0.10	2.84	− 0.28
α Ursæ Minoris	1.2	1 20 48.95_{58}	12.59_{40}	+ 1.54	− 2.89	− 1.35	4.87	− 6.57
B. A. C. 4165	12.2	1 37 7.43_{3}	54.40_{4}	+ 1.83	− 2.87	− 1.04	1.43	− 1.49
51 Cephei	6.7	2 46 3.47_{10}	58.24_{18}	+ 1.71	− 2.83	− 1.12	3.23	− 3.62
B. A. C. 1879	6.0	3 14 16.30_{1}	45.30_{1}	+ 1.60	− 2.82	− 1.22	0.50	− 0.61
B. A. C. 8213	23.5	3 22 17.30_{1}	44.30_{1}	+ 1.60	− 2.82	− 1.22	0.50	− 0.61
δ Ursæ Minoris	18.2	3 23 30.82_{27}	31.88_{15}	+ 2.70	− 2.82	− 0.12	3.82	− 0.46
Lalande (F.) 519	3.4	3 44 41.83_{3}	18.90_{1}	+ 0.73	− 2.83	− 2.10	0.72	− 1.51
2 Ursæ Minoris	0.9	4 24 14.83_{3}	47.27_{3}	+ 2.10	− 2.85	− 0.75	1.28	− 0.96
B. A. C. 1662	5.4	4 52 18.80_{2}	43.50_{2}	+ 2.30	− 2.87	− 0.57	0.92	− 0.52
32¹ Camelopardalis	12.8	5 55 7.69_{3}	54.94_{5}	+ 2.63	− 2.94	− 0.31	1.52	− 0.47
32² Camelopardalis	12.8	5 54 48.30_{3}	13.04_{5}	+ 1.34	− 2.94	− 1.60	1.52	− 2.43
B. A. C. 1247	4.0	6 29 55.05_{2}	6.80_{1}	+ 1.85	− 3.02	− 1.17	0.65	− 0.76
B. A. C. 5352	15.9	6 41 4.00_{1}	57.00_{3}	+ 1.00	− 3.06	− 2.06	0.72	− 1.48
B. A. C. 4982	15.0	6 59 5.60_{1}	57.20_{1}	+ 2.80	− 3.10	− 0.30	0.50	− 0.15
B. A. C. 2677	8.0	7 11 39.00_{1}	23.80_{1}	+ 2.80	− 3.13	− 0.33	0.50	− 0.16
B. A. C. 2326	7.1	7 21 30.85_{2}	32.55_{2}	+ 3.40	− 3.15	+ 0.25	0.92	+ 0.23
ε Ursæ Minoris	17.0	7 45 48.72_{11}	13.52_{7}	+ 2.24	− 3.22	− 0.98	2.62	− 2.57
1 Draconis	9.3	8 7 59.37_{3}	2.39_{3}	+ 1.76	− 3.26	− 1.50	1.28	− 1.92
B. A. C. 908	2.9	9 0 32.30_{1}	29.00_{1}	+ 1.30	− 3.33	− 2.03	0.50	− 1.02
B. A. C. 1448	4.6	9 0 59.53_{3}	3.70_{1}	+ 3.23	− 3.3[illegible]	− 0.10	0.72	− 0.07
12-yr. Cat. 1879	20.9	9 54 36.28_{1}	25.47_{4}	+ 1.75	− 3.32	− 1.57	0.76	− 1.19
4 Draconis	12.1	11 42 2.42_{4}	0.26_{1}	+ 2.68	− 3.28	− 0.60	0.76	− 0.46
ζ Ursæ Minoris	15.8	11 49 42.73_{7}	20.11_{2}	+ 2.84	− 3.27	− 0.43	1.33	− 0.57
κ Cephei	20.2	12 39 36.96_{1}	26.14_{2}	+ 3.10	− 3.24	− 0.14	0.65	− 0.[illegible]
48 Cephei	3.1	12 43 14.06_{4}	48.36_{3}	+ 2.42	− 3.24	− 0.82	1.43	− 1.17
γ Cephei	23.6	13 3 15.80_{1}	46.13_{3}	+ 1.93	− 3.23	− 1.30	0.72	− 0.94
9 Draconis	10.4	13 39 17.68_{4}	45.17_{2}	+ 2.85	− 3.22	− 0.37	1.17	− 0.43
5 Ursæ Minoris	14.5	13 45 26.54_{2}	33.21_{2}	− 0.25	− 3.22	− 3.47	0.92	− 3.19
226 Cephei	22.5	14 24 26.96_{1}	35.66_{4}	+ 2.62	− 3.23	− 0.61	0.76	− 0.46
50 Draconis	18.8	14 42 44.95_{1}	19.35_{1}	+ 4.30	− 3.24	+ 1.06	0.50	+ 0.53
β Ursæ Minoris	14.9	15 20 31.86_{8}	31.89_{2}	+ 3.75	− 3.27	+ 0.48	1.35	+ 0.65
Groom. 4163	23.8	16 16 27.22_{1}	34.23_{2}	+ 1.45	− 3.30	− 1.85	0.65	− 1.20
79 Draconis	21.9	16 52 48.35_{3}	16.29_{5}	+ 4.64	− 3.30	+ 1.34	1.52	+ 2.04
ψ² Draconis	17.7	17 46 59.60_{2}	2.25_{2}	+ 1.85	− 3.28	− 1.43	0.92	− 1.32

TABLE IX.—*Computation of the Value of $\Delta\varphi$ from the Observations in* 1877—Cont'd.

Name of Star.	a	Observed N. P. Distance. Culmination— Upper.	Observed N. P. Distance. Culmination— Lower.	U. + L. − 360°	Corr. to U. + L. − 360°	$2\Delta\phi$	p	$2p\Delta\phi$
	h.	° ′ ″	″	″	″	″		″
ψ^1 Draconis	17.7	17 47 29.09_2	33.46_2	+ 2.55	− 3.28	− 0.73	0.92	− 0.67
Groombridge 3241 .	20.5	17 53 7.73_1	54.87_2	+ 2.60	− 3.28	− 0.68	0.65	− 0.44
50 Cassiopeæ	1.9	18 10 32.53_6	30.36_6	+ 2.89	− 3.27	− 0.38	1.99	− 0.76
κ Draconis	12.5	19 32 2.06_2	0.39_3	+ 2.45	− 3.20	− 0.75	1.08	− 0.81
d Ursæ Minoris . . .	9.4	19 37 51.25_1	9.15_2	+ 0.40	− 3.20	− 2.80	0.65	− 1.82
β Cephei	21.5	19 58 45.44_6	17.86_1	+ 3.30	− 3.17	+ 0.13	0.79	+ 0.10
λ Draconis	11.4	19 59 26.32_4	35.05_2	+ 1.37	− 3.17	− 1.80	1.17	− 2.11
22 Camelopardalis . .	6.1	20 38 27.64_3	35.23_3	+ 2.87	− 3.13	− 0.26	1.28	− 0.33
ω Draconis	17.6	21 11 8.40_5	53.44_1	+ 1.84	− 3.08	− 1.24	0.79	− 0.98
Piazzi VII, 67 . . .	7.3	21 17 11.71_1	49.59_1	+ 1.30	− 3.08	− 1.78	0.50	− 0.89
B. A. C. 2439 . . .	7.3	21 17 12.65_2	48.80_1	+ 1.45	− 3.08	− 1.63	0.65	− 1.06
σ^2 Ursæ Majoris . . .	9.0	22 22 7.30_1	55.30_1	+ 2.60	− 2.98	− 0.38	0.50	− 0.19
δ Draconis	19.2	22 33 18.40_8	42.09_1	+ 0.49	− 2.96	− 2.47	0.83	− 2.05
o Cephei	23.2	22 33 41.27_3	20.30_1	+ 1.57	− 2.96	− 1.39	0.72	− 1.00
ι Cassiopeæ	2.3	23 9 8.76_4	53.85_3	+ 2.61	− 2.91	− 0.30	1.43	− 0.43
9 Camelopardalis . .	4.7	23 52 11.23_6	51.75_2	+ 2.98	− 2.84	+ 0.14	1.25	+ 0.18
ι Cephei	22.8	24 26 46.73_3	14.06_4	+ 0.79	− 2.81	− 2.02	1.43	− 2.89
a Draconis	14.0	25 2 10.71_3	50.29_1	+ 1.00	− 2.79	− 1.79	0.72	− 1.29
a Cephei	21.3	27 56 7.51_{11}	52.93_2	+ 0.44	− 2.64	− 2.20	1.41	− 3.10
								$\Delta\phi = -0''.44$

Collecting the results from all the available data, the total systematic correction to be applied to an observed north polar distance in 1877, is:

For objects north of the zenith:

Observed directly - - - Div. Corr. $+ 0''.41 \sin (\Delta + 265^\circ.7) - 0''.78 + 0''.44$

Observed by reflection - Div. Corr. $+ 0''.31 \sin (\Delta + 192^\circ.3) + 0''.78 + 0''.44$

For objects south of the zenith:

Observed directly - - - Div. Corr. $+ 0''.41 \sin (\Delta + 265^\circ.7) + 0''.01 + 0''.44$

Observed by reflection - Div. Corr. $+ 0''.31 \sin (\Delta + 192^\circ.3) - 0''.01 + 0''.44$

The numerical values of these expressions are given in Table X with the argument north polar distance. The *second* column contains the corrections for the errors in the division of circle B. The *third* column contains the sums of the corrections for flexure of circle B, flexure of telescope, effect of gravity on the zenith-distance micrometer, and, in the case of reflection observations, curvature of the surface of the mercury. The *fourth* column contains the sum of the corrections for errors in the assumed latitude and constant error in the zenith point.

As the computed value of ΔZ is not the same for northern as for southern objects, to avoid an abrupt change at the zenith, the value is gradually changed between 46° and 56° north polar distance. The *fifth* column contains the sum of all the corrections.

TABLE X.—*Systematic Corrections to be applied to the North Polar Distances of Objects observed with the Transit Circle in* 1877.

DIRECT OBSERVATIONS.

N. P. D.	Division.	Flexure.	$\delta s + \delta\phi$	Total.	N. P. D.	Division.	Flexure.	$\delta s + \delta\phi$	Total.
°	"	"	"	"	°	"	"	"	"
1	− 0.27	− 0.41	− 0.34	− 1.02	46	− 0.12	− 0.30	− 0.34	− 0.76
2	.23	.41	. .	0.98	47	.07	.29	.26	.62
3	.19	.41	. .	0.94	48	− .01	.29	.18	.48
4	.18	.41	. .	0.93	49	.00	.28	.10	.38
5	.22	.41	. .	0.97	50	.00	.28	− .02	.30
6	− 0.29	− 0.41	. .	− 1.04	51	+ 0.01	− 0.27	+ 0.05	− 0.21
7	.36	.41	. .	1.11	52	.06	.27	.13	− .08
8	.43	.40	. .	1.17	53	.12	.26	.21	+ .07
9	.44	.40	. .	1.18	54	.12	.26	.29	.15
10	.41	.40	. .	1.15	55	+ .08	.25	.37	.20
11	− 0.37	− 0.40	. .	− 1.11	56	− 0.01	− 0.25	+ 0.45	+ 0.19
12	.36	.40	. .	1.10	57	.07	.24	. .	.14
13	.36	.40	. .	1.10	58	.13	.23	. .	.09
14	.38	.40	. .	1.12	59	.15	.23	. .	.07
15	.40	.40	. .	1.14	60	.13	.22	. .	.10
16	− 0.43	− 0.40	. .	− 1.17	61	− 0.11	− 0.22	. .	+ 0.12
17	.45	.39	. .	1.18	62	.14	.21	. .	.10
18	.46	.39	. .	1.19	63	.18	.20	. .	.07
19	.45	.39	. .	1.18	64	.21	.20	. .	.04
20	.41	.39	. .	1.14	65	.24	.19	. .	+ .02
21	− 0.36	− 0.39	. .	− 1.09	66	− 0.26	− 0.19	. .	0.00
22	.32	.38	. .	1.04	67	.33	.18	. .	− .06
23	.29	.38	. .	1.01	68	.39	.17	. .	.11
24	.27	.38	. .	0.99	69	.42	.17	. .	.14
25	.25	.38	. .	0.97	70	.44	.16	. .	.15
26	− 0.24	− 0.38	. .	− 0.96	71	− 0.46	− 0.15	. .	− 0.16
27	.23	.37	. .	.94	72	.49	.15	. .	.19
28	.22	.37	. .	.93	73	.52	.14	. .	.21
29	.22	.37	. .	.93	74	.52	.13	. .	.20
30	.22	.37	. .	.93	75	.50	.13	. .	.18
31	− 0.22	− 0.36	. .	− 0.92	76	− 0.48	− 0.12	. .	− 0.15
32	.24	.36	. .	.94	77	.52	.11	. .	.18
33	.27	.35	. .	.96	78	.56	.11	. .	.22
34	.28	.35	. .	.97	79	.57	.10	. .	.22
35	.26	.35	. .	.95	80	.56	.09	. .	.20
36	− 0.23	− 0.34	. .	− 0.91	81	− 0.53	− 0.09	. .	− 0.17
37	.20	.34	. .	.88	82	.46	.08	. .	− .09
38	.19	.34	. .	.87	83	.38	.07	. .	.00
39	.17	.33	. .	.84	84	.30	.07	. .	+ .08
40	.16	.33	. .	.83	85	.29	.06	. .	.10
41	− 0.15	− 0.32	. .	− 0.81	86	− 0.29	− 0.05	. .	+ 0.11
42	.14	.32	. .	.80	87	.27	.04	. .	.14
43	.13	.31	. .	.78	88	.26	.04	. .	.15
44	.12	.31	. .	.77	89	.26	.03	. .	.16
45	.12	.30	. .	.76	90	.27	.02	. .	.16

TABLE X.—*Systematic Corrections, etc.*—Continued.

DIRECT OBSERVATIONS—Continued.

N. P. D.	Division.	Flexure.	$\delta z + \delta \phi$	Total.
°	″	″	″	″
91	− 0.27	− 0.02	+ 0.45	+ 0.16
92	.23	− .01	. .	.21
93	.19	.00	. .	.26
94	.18	.00	. .	.27
95	.22	+ .01	. .	.24
96	− 0.29	+ 0.02	. .	+ 0.18
97	.36	.03	. .	.12
98	.43	.03	. .	.05
99	.44	.04	. .	.05
100	.41	.05	. .	.09
101	− 0.37	+ 0.05	. .	+ 0.13
102	.36	.06	. .	.15
103	.36	.07	. .	.16
104	.38	.08	. .	.15
105	.40	.08	. .	.13
106	− 0.43	+ 0.09	. .	+ 0.11
107	.45	.10	. .	.10
108	.46	.10	. .	.09
109	.45	.11	. .	.11
110	.41	.12	. .	.16
111	− 0.36	+ 0.12	. .	+ 0.21
112	.32	.13	. .	.26
113	.29	.14	. .	.30
114	.27	.14	. .	.32
115	.25	.15	. .	.35
116	− 0.24	+ 0.16	. .	+ 0.37
117	.23	.16	. .	.38
118	.22	.17	. .	.40
119	.22	.18	. .	.41
120	.22	.18	. .	.41
121	− 0.22	+ 0.19	. .	+ 0.42
122	.24	.19	. .	.40
123	.27	.20	. .	.38
124	.28	.21	. .	.38
125	.26	.21	. .	.40
126	− 0.23	+ 0.22	. .	+ 0.44
127	.20	.23	. .	.48
128	.19	.23	. .	.49
129	.17	.24	. .	.52
130	.16	.24	. .	.53
131	− 0.15	+ 0.25	+ 0.45	+ 0.55
132	.14	.25	. .	.56
133	.13	.26	. .	.58
134	.12	.26	. .	.59
135	.12	.27	. .	.60
136	− 0.12	+ 0.28	. .	+ 0.61
S. P.				
325	+ 0.08	− 0.32	− 0.34	− 0.58
326	− .01	.32	. .	.67
327	.07	.33	. .	.74
328	.13	.33	. .	.80
329	.15	.34	. .	.83
330	− 0.13	− 0.34	. .	− 0.81
331	.11	.34	. .	.79
332	.14	.35	. .	.83
333	.18	.35	. .	.87
334	.21	.35	. .	.90
335	− 0.24	− 0.36	. .	− 0.94
336	.26	.36	. .	0.96
337	.33	.36	. .	1.03
338	.39	.37	. .	1.10
339	.42	.37	. .	1.13
340	− 0.44	− 0.37	. .	− 1.15
341	.46	.38	. .	1.18
342	.49	.38	. .	1.21
343	.52	.38	. .	1.24
344	.52	.38	. .	1.24
345	− 0.50	− 0.39	. .	− 1.23
346	.48	.39	. .	1.21
347	.52	.39	. .	1.25
348	.56	.39	. .	1.29
349	.57	.39	. .	1.30
350	− 0.56	− 0.40	. .	− 1.30
351	.53	.40	. .	1.27
352	.46	.40	. .	1.20
353	.38	.40	. .	1.12
354	.30	.40	. .	1.04
355	− 0.29	− 0.40	. .	− 1.03
356	.29	.40	. .	1.03
357	.27	.40	. .	1.01
358	.26	.40	. .	1.00
359	.26	.41	. .	1.01
360	− 0.27	− 0.41	. .	− 1.02

TABLE X.—*Systematic Corrections, etc.*—Continued.

REFLECTION OBSERVATIONS.

N. P. D.	Division.	Flexure.	$dz + d\varphi$	Total.	N. P. D.	Division.	Flexure.	$dz + d\varphi$	Total.
°	"	"	"	"		"	"	"	"
1	+ 0.36	− 0.07	+ 1.22	+ 1.51	57	+ 0.12	− 0.29	+ 0.42	+ 0.25
2	.40	.08	. .	.54	58	.12	.29	. .	.25
3	.44	.08	. .	.58	59	.13	.29	. .	.26
4	.44	.09	. .	.57	60	.14	.30	. .	.26
5	.37	.09	. .	.50	61	.15	.30	. .	.27
6	+ 0.30	− 0.10	. .	+ 1.42	62	+ 0.16	− 0.30	. .	+ 0.28
7	.23	.10	. .	.35	63	.17	.30	. .	.29
8	.18	.11	. .	.29	64	.19	.30	. .	.31
9	.18	.11	. .	.29	65	.20	.30	. .	.32
10	.22	.12	. .	.32	66	.22	.30	. .	.34
11	+ 0.27	+ 0.12	. .	+ 1.37	67	+ 0.26	− 0.31	. .	+ 0.37
12	.27	.13	. .	.36	68	.28	.31	. .	.39
13	.26	.13	. .	.35	69	.27	.31	. .	.38
14	.26	.14	. .	.34	70	.25	.31	. .	.36
15	.27	.14	. .	.35	71	.22	.31	. .	.33
16	+ 0.29	− 0.15	. .	+ 1.36	72	+ 0.22	− 0.31	. .	+ 0.33
17	.29	.15	. .	.36	73	.22	.31	. .	.33
18	.29	.16	. .	.35	74	.22	.31	. .	.33
19	.36	.16	. .	.42	75	.23	.31	. .	.34
20	.44	.17	. .	.49	76	.24	.31	. .	.35
21	+ 0.52	− 0.17	. .	+ 1.57	77	+ 0.25	− 0.31	. .	+ 0.36
22	.56	.18	. .	.60	78	.27	.31	. .	.38
23	.57	.18	. .	.61	79	.28	.31	. .	.39
24	.57	.18	. .	.61	80	.31	.31	. .	.42
25	.52	.19	. .	.55	81	.35	.31	. .	.46
26	+ 0.48	− 0.19	. .	+ 1.51	82	+ 0.40	− 0.31	. .	+ 0.51
27	.49	.20	. .	.51	83	.45	.31	. .	.56
28	.52	.20	. .	.54	84	.46	.31	. .	.57
29	.53	.21	. .	.54	85	.45	.31	. .	.56
30	.50	.21	. .	.51	86	.44	.31	. .	.55
31	+ 0.46	− 0.21	. .	+ 1.47	87	+ 0.41	− 0.31	. .	+ 0.52
32	.44	.22	. .	.44	88	.38	.31	. .	.49
33	.42	.22	. .	.42	89	.36	.31	. .	.47
34	.40	.22	. .	.40	90	.36	.30	. .	.48
35	.34	.23	. .	.33	91	.36	.30	. .	.48
36	+ 0.27	− 0.23	. .	+ 1.26	92	+ 0.40	− 0.30	. .	+ 0.52
37	.24	.24	. .	.22	93	.44	.30	.	.56
38	.22	.24	. .	.20	94	.44	.30	. .	.56
39	.19	.24	. .	.17	95	.37	.30	. .	.49
40	.15	.25	. .	.12	96	.30	.30	. .	.42
41	+ 0.11	− 0.25	. .	+ 1.08	97	+ 0.23	− 0.29	. .	+ 0.36
42	.12	.25	. .	.09	98	.18	.29	. .	.31
43	.15	.26	. .	.11	99	.18	.29	. .	.31
44	.14	.26	. .	.10	100	.22	.29	. .	.35
45	+ 0.08	− 0.26	. .	+ 1.04	101	+ 0.27	− 0.29	. .	+ 0.40

Since the assumed value of the latitude is $+38^\circ\ 53'\ 38''.80$, the value given by each year's observations will be $+38^\circ\ 53'\ 38''.80 + \Delta\varphi$.

The observed north polar distances used in computing $\Delta\varphi$ had been corrected for constant error in the zenith point, and, in order to separate the values of the latitude obtained from direct and reflection observations, those corrections should be removed; hence,

Latitude from direct observations - - $= +38^\circ\ 53'\ 38''.80 + \Delta\varphi + \Delta Z$
Latitude from reflection observations - $= +38^\circ\ 53'\ 38''.80 + \Delta\varphi - \Delta Z$

The following table exhibits the results obtained from 1866 to 1877:

TABLE XI.

Year.	Latitude from Direct Observations.	Latitude from Reflection Observations.	Mean.
	° ′ ″	° ′ ″	″
1866	+ 38 53 38.73	+ 38 53 37.67	38.20
1867	39.16	37.48	38.32
1868	38.69	37.73	38.21
1869	38.62	38.90	38.76
1870	38.71	39.57	39.14
1871 1872	39.11	36.49	37.80
1873	38.91	37.89	38.40
1874	38.31	38.27	38.29
1875	39.22	37.32	38.27
1876	38.64	37.50	38.07
1877	+ 38 53 39.14	+ 38 53 37.58	38.36

POSITIONS AND SEMI-DIAMETERS OF THE SUN, MOON, AND PLANETS, DEDUCED FROM OBSERVATIONS WITH THE TRANSIT CIRCLE IN 1877 AND COMPARED WITH THE TABLES.

The results of the observations are given on pages 323 to 336 and require very little explanation.

When both limbs of an object presenting a fully illuminated disk have been observed, the adopted position of the center is the mean of that of the two limbs given in the eleventh and thirteenth columns of the observations. When only one full limb has been observed, the right ascension of the center is derived from the observed place of the limb by applying the "Time of the semi-diameter passing the meridian," taken from the Ephemeris. The declination of the center is obtained by applying the semi-diameter of the Ephemeris.

If one of the limbs observed was defective, the observed difference of right ascension or declination of limbs is multiplied by the ratio of half this difference to the true semi-diameter, and the observed semi-diameter thus deduced is applied to the observed position of the full limb to obtain that of the center. The factors are determined as follows:

Let

i = the elongation of earth and sun as seen from the planet;
$b = \cos i$;
$\delta\ \delta'$ = declinations of planet and sun;
A = difference of right ascensions of planet and sun;
θ = the angle which the line of cusps makes with the meridian;
f, f' = factors by which the measured diameters in right ascension and declination must be multiplied to obtain true semi-diameters.

To find f, we have

$$\tan\theta = \frac{\cos\delta\tan\delta'}{\sin A} - \frac{\sin\delta}{\tan A}$$

When the planet is gibbous;

$$g = \cos\theta\sqrt{b^2 + \tan^2\theta} = \cos\theta'' \quad , \quad \text{when } \sin\theta'' = \cos\theta\sin i$$
$$g' = \sin\theta\sqrt{b^2 + \cot^2\theta} = \cos\theta' \quad , \quad \text{when } \sin\theta' = \sin\theta\sin i$$

$$f = \frac{1}{1+g} \quad \text{and } f' = \frac{1}{1+g'}$$

When the illuminated disk is a crescent,

$$g = \cos\theta \qquad f = \frac{1}{1+g}$$

$$g' = \sin\theta \qquad f' = \frac{1}{1+g'}$$

When the center of light of Mercury has been observed, its reduction to the center of the planet is denoted by ε, and its value is obtained from the empirical formulæ

$$n = \frac{(1-b)(5-b)}{12}$$

In right ascension, - - - - ε = semi-diameter $\times\ n\cos\theta$
In north polar distance, - - - ε = semi-diameter $\times\ n\sin\theta$

The north polar distances are also corrected for parallax in altitude, found at the foot of the pages of observations, and for errors of division, flexure, etc., taken from Table X.

A discussion of all the observations of the sun made in 1877 gives the following results:

TABLE XII.—*Corrections to the Semi-diameters of the Sun, given in the American Ephemeris, obtained from the mean of all the measures made by each Observer in* 1877.

Observer.	Sidereal Time of Semi-diameter passing the Meridian.	Vertical Semi-diameter.
	s.	″
Eastman . .	$-\ 0.01_{14}$	0.0_{15}
Frisby . . .	$-\ 0.02_{12}$	$-\ 0.6_{13}$
Skinner . .	$-\ 0.07_{15}$	$-\ 0.8_{15}$
Paul . . .	$-\ 0.12_{11}$	$-\ 1.8_{11}$

The subscript figures indicate the number of observations on which each value depends.

When only one limb of the sun was observed, the quantity in the last column of the observations is the semi-diameter of the Ephemeris corrected by means of the above table.

The places of the moon at the time of transit at Washington are not given either in the American Ephemeris or the English Nautical Almanac, but are computed in the following manner: The observed right-ascension of the center is reduced to Washington mean time, or, if only the north polar distance is observed, the mean time of transit of the center is taken directly from the American Ephemeris. Increasing this quantity by $5^h\ 8^m\ 12^s$ gives Greenwich mean time, with which, as an argument, the tabular place is interpolated from the hourly Ephemeris for Greenwich.

The places in the American Ephemeris and in the English Nautical Almanac are respectively those of Peirce's and Hansen's tables.

The observations of the major planets are compared with the data given in the American Ephemeris for the instant of transit at Washington. The places of Venus, according to Le Verrier's tables, are obtained by applying to the positions given in the American Ephemeris for the transit at Washington, the differences between the positions for Greenwich noon, given respectively in that Ephemeris and in the English Nautical Almanac.

The observations of the minor planets Ceres, Pallas, Juno, Vesta, and Astræa are compared with the ephemerides in the Appendix to the English Nautical Almanac, from which the position is interpolated for the difference in longitude. The other minor planets are compared with the ephemerides in the Berliner Jahrbuch.

The observed time of transit converted into Washington mean time and increased by $6^h\ 1^m.8$ gives the Berlin mean time of transit. Subtracting the "aberration time" of the Ephemeris leaves the Berlin mean time at which the light left the planet, and for this instant the position of the planet is interpolated from the Ephemeris in the Jahrbuch and compared with the observed place.

TABLE A.—*Absolute Determinations of the Collimation Constant of the Transit Circle in* 1877.

Date.		M	M'	$M + M'$	$M + M' \times$ 0ˢ.512	c_τ	τ	− 0.004 τ	c_0
1877.		r.	r.	r.	s.	s.	°	s.	s.
January	17	− 0.301	+ 0.333	+ 0.032	+ 0.016	− 0.011	35.5	− 0.142	− 0.153
February	5	− 0.150	+ 0.191	+ 0.041	+ 0.021	− 0.006	40.5	− 0.162	− 0.168
	13	− 0.409	+ 0.334	− 0.075	− 0.038	− 0.065	28.5	− 0.114	− 0.179
March	1	− 0.175	+ 0.155	− 0.020	− 0.010	− 0.037	44.0	− 0.176	− 0.213
	16	+ 0.131	− 0.082	+ 0.049	+ 0.025	− 0.002	39.4	− 0.158	− 0.160
April	6	0.000	+ 0.168	+ 0.168	+ 0.086	+ 0.059	51.0	− 0.204	− 0.145
	26	− 0.118	+ 0.303	+ 0.185	+ 0.095	+ 0.068	61.3	− 0.245	− 0.177
May	4	+ 0.148	− 0.074	+ 0.074	+ 0.038	+ 0.011	55.5	− 0.222	− 0.211
	12	0.188	0.086	0.102	0.052	0.025	64.5	0.258	0.233
	28	0.247	0.078	0.169	0.087	0.060	64.3	0.257	0.197
	31	0.346	0.088	0.258	0.132	0.105	66.0	0.264	0.159
June	13	+ 0.380	− 0.125	+ 0.255	+ 0.131	+ 0.104	73.8	− 0.295	− 0.191
	26	+ 0.279	− 0.056	+ 0.223	+ 0.114	+ 0.087	87.0	− 0.348	− (0.261)
July	7	+ 0.108	+ 0.122	+ 0.230	+ 0.118	+ 0.091	75.5	− 0.302	− 0.211
	13	0.122	0.212	0.334	0.171	0.144	69.4	0.278	0.134
	18	+ 0.098	0.216	+ 0.314	0.161	0.134	81.2	0.325	0.191
August	1	+ 0.122	+ 0.223	+ 0.345	+ 0.177	+ 0.150	76.5	− 0.306	− 0.156
	10	− 0.133	0.494	0.361	0.185	0.158	77.0	0.308	0.150.
	16	0.248	0.700	0.452	0.231	0.204	78.5	0.314	0.110
	21	0.148	0.464	0.316	0.162	0.135	82.0	0.328	0.193
	23	− 0.139	0.523	0.384	0.197	0.170	77.5	0.310	0.140
September	3	− 0.190	+ 0.531	+ 0.341	+ 0.175	+ 0.148	72.8	− 0.291	− 0.143
	18	0.306	0.691	0.385	0.197	0.170	64.5	0.258	0.088
	26	0.210	0.494	0.284	0.145	0.118	71.4	0.286	0.169
October	13	− 0.193	+ 0.421	+ 0.228	+ 0.117	+ 0.090	56.5	− 0.226	− 0.136
	23	− 0.228	+ 0.374	+ 0.146	+ 0.075	+ 0.048	59.5	− 0.238	− 0.190
November	8	− 0.242	+ 0.428	+ 0.186	+ 0.095	+ 0.068	46.2	− 0.185	− 0.117
	20	+ 0.158	− 0.140	0.018	+ 0.009	− 0.018	44.5	− 0.178	− 0.196
December	3	+ 0.228	− 0.158	+ 0.070	+ 0.036	+ 0.009	32.5	− 0.130	− 0.121
	22	+ 0.220	− 0.066	0.154	0.079	0.052	48.5	4.194	0.142
	31	− 0.418	+ 0.641	0.223	0.114	0.087	39.2	0.157	0.070
1878. January	2	− 0.289	+ 0.380	+ 0.091	+ 0.047	+ 0.020	32.8	− 0.131	− 0.111

The adopted mean value of c_0 =, before August 4, − 0ˢ.180.
=, after August 4, − 0ˢ.140.

TABLE B.—*Adopted Values of the Collimation, Level, and Azimuth Constants employed in the reduction of the Observations with the Transit Circle in 1877.*

Month and Day.	Sidereal Hour.	*c*	*b*	*a*	Month and Day.	Sidereal Hour.	*c*	*b*	*a*
1877. d.	h.	s.	s.	s.	1877. d.	h.	s.	s.	s.
January 23.9	18.5	− 0.060	+ 0.080	− 0.816	February 7.9	20.3	− 0.018	+ 0.015	− 0.949
24.1	23.0	.058	.080	.816	8.1	22.4	.003	. .	.949
24.3	3.7	.084	.086	.816	8.2	1.2	.000	.048	.949
24.4	6.9	.086	.086	.816	8.3	4.7	.031	.059	.949
24.9	17.7	.089	.124	.846	8.5	8.6	0.046	.059	.949
24.9	19.7	− 0.074	+ 0.124	− 0.846	8.9	20.6	− 0.024	+ 0.125	− 1.035
25.3	3.2	.068	.110	.846	9.1	0.8	.000	.045	1.035
25.4	6.8	.075	.110	.846	9.4	5.1	.034	.083	1.035
25.9	19.1	.068	.126	.901	9.5	9.5	.051	.083	1.035
26.1	23.1	.019	.126	.901	9.9	18.8	.053	.033	1.074
26.4	5.0	− 0.036	+ 0.129	− 0.901	10.0	21.2	− 0.018	+ 0.033	− 1.074
26.6	10.1	.068	.129	.901	10.1	23.0	− 0.002	.033	1.074
26.9	19.2	− 0.032	.166	.766	10.2	1.1	+ 0.004	.033	1.074
27.1	22.5	+ 0.022	.130	.766	10.3	4.5	− 0.023	.087	1.074
27.5	9.2	− 0.027	.122	.766	10.5	9.6	− 0.050	.087	1.074
28.5	7.4	− 0.048	+ 0.048	− 0.810	12.2	1.2	+ 0.076	+ 0.018	− 0.939
28.9	19.9	− 0.022	.090	.746	12.9	18.7	− 0.078	.060	1.091
29.1	23.0	+ 0.022	.090	.746	13.0	20.5	.058	. .	1.091
29.4	5.7	− 0.024	.094	.746	13.1	0.8	.026	.141	1.091
29.9	17.7	.056	.051	.850	13.4	6.2	.070	.116	1.091
29.9	19.4	− 0.019	+ 0.051	− 0.850	13.5	10.2	− 0.084	+ 0.116	− 1.091
30.1	23.3	+ 0.024	.051	.850	14.3	5.4	.038	.124	1.002
30.3	4.6	− 0.012	.054	.850	14.5	9.9	.069	.124	1.002
30.6	11.3	.043	.054	.850	14.9	19.7	.053	.178	1.252
30.9	18.5	.044	.075	.770	15.0	20.3	− 0.034	.178	1.252
30.9	19.8	− 0.020	+ 0.075	− 0.770	15.1	1.2	+ 0.004	+ 0.178	− 1.252
February 1.3	4.8	+ 0.036	.001	. .	15.3	4.9	− 0.017	.111	1.252
3.4	6.1	− 0.008	.002	.688	15.6	11.2	.036	.111	1.252
3.6	10.2	.036	.012	.688	15.8	17.9	.040	.088	1.252
5.9	19.6	− 0.016	.040	.795	15.9	20.1	.006	.088	1.252
6.1	23.8	+ 0.014	+ 0.040	− 0.795	16.9	19.8	− 0.046	+ 0.125	− 1.278
6.3	5.1	− 0.007	.064	.795	17.1	1.2	.020	.074	1.278
6.5	10.2	.035	.064	0.795	17.3	5.6	.046	.088	1.278
6.9	18.5	.044	.078	1.035	17.5	10.2	.064	.088	1.278
6.9	20.1	− 0.016	.078	1.035	19.3	6.5	.036	.154	1.286
7.1	23.1	+ 0.044	+ 0.078	− 1.035	19.5	10.6	− 0.052	+ 0.154	− 1.286
7.3	4.3	+ 0.014	− 0.017	1.035	20.1	1.2	.027	.096	1.266
7.6	10.7	− 0.030	. .	1.035	20.2	3.7	.030	. .	1.266
7.8	16.2	.049	+ 0.091	1.035	20.3	6.2	. .	.102	1.266
7.9	18.2	.041	.044	0.949	20.6	13.6	.056	.217	1.266

Table B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—**Continued.**

Month and Day.		Sidereal Hour.	*c*	*b*	*a*	Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s,	s.	s.	1877.	d.	h.	s.	s.	s.
Februry	20.9	19.3	− 0.024	+ 0.013	− 1.317	March	24.4	10.9	+ 0.038	+ 0.088	− 0.832
	20.9	20.8	+ .005	. .	1.317		24.5	13.2	+ 0.026	+ 0.088	0.832
	21.1	1.6	.059	.035	1.317		29.4	9.4	− 0.008	− 0.074	1.237
	21.3	4.7	+ 0.025	.047	1.317		29.5	13.2	− 0.028	.074	1.237
	21.5	9.7	− 0.027	+ 0.047	1.317		30.0	0.6	+ 0.022	.140	1.321
	25.4	7.1	− 0.017	− 0.032	− 1.347		30.1	3.5	+ 0.043	− 0.140	− 1.321
	25.5	9.4	.032	− 0.032	1.347		30.4	9.0	+ 0.001	.020	1.321
	27.5	9.3	.038	+ 0.044	(1.600)		30.6	14.7	− 0.027	.020	1.321
	27.6	11.7	.051	.044		April	5.4	9.6	.010	.041	1.090
	27.9	21.1	− 0.014	. .	1.396		5.6	13.2	− .023	.009	1.090
	28.0	22.5	+ 0.005	+ 0.050	− 1.396		5.9	22.0	+ 0.015	− 0.074	− 1.113
	28.1	1.2	+ 0.012	.078	1.396		5.9	23.4	.024	.074	1.113
	28.4	8.9	− 0.034	.014	1.396		6.3	8.8	+ 0.038	.128	1.113
	28.5	11.3	.045	.014	1.396		6.8	20.5	− 0.010	.118	1.113
	28.9	19.7	− 0.034	.088	1.307		6.9	0.1	+ 0.044	.075	1.098
Maich	1.0	21.9	+ 0.015	. .	− 1.307		7.0	1.2	+ 0.053	− 0.075	− 1.098
	1.1	1.2	.040	+ 0.006	1.307		7.1	4.8	.072	.075	1.098
	2.9	19.7	.004	− 0.049	1.296		7.3	8.9	+ 0.030	.075	1.098
	3.1	1.2	+ 0.046	− 0.049	1.296		7.5	13.2	− 0.002	.075	1.098
	5.9	21.1	− 0.050	+ 0.084	1.393		10.9	23.7	+ 0.041	.155	1.230
	6.0	22.4	− 0.035	+ 0.084	− 1.393		11.0	1.2	+ 0.052	− 0.155	− 1.230
	6.1	0.8	.015	+ 0.084	1.393		11.1	4.8	.080	.155	1.230
	7.5	10.0	.011	− 0.005	1.568		11.3	8.7	.053	.011	1.230
	7.6	13.2	.011	.005	1.568		11.6	14.7	.017	.011	1.230
	9.3	7.8	.052	.068	1.157		11.9	22.6	.036	.142	1.318
	9.5	10.2	− 0.062	− 0.068	− 1.157		12.1	4.1	+ 0.076	− 0.142	− 1.318
	14.9	21.6	.046	+ 0.067	1.022		12.3	8.8	+ 0.045	.138	1.318
	15.0	22.3	.042	.067	1.022		12.5	14.4	− 0.001	.123	1.318
	15.1	2.0	.014	.067	1.022		14.3	9.4	+ 0.016	.193	1.441
	15.3	7.8	.036	.006	1.022		14.5	13.2	− 0.016	.193	1.441
	15.6	13.2	− 0.044	. .	− 1.022		20.3	8.4	+ 0.064	− 0.128	− 1.015
	15.7	16.6	.048	+ 0.108	1.022		20.4	10.5	.038	.128	1.015
	19.9	22.0	.059	.110	1.396		21.3	9.0	.037	.129	1.131
	20.1	1.2	.041	.110	1.396		21.5	13.2	.006	.157	1.131
	20.2	4.5	.026	.110	1.396		22.3	10.2	.066	.228	1.296
	20.3	7.8	− 0.050	+ 0.048	− 1.396		22.5	13.3	+ 0.048	− 0.228	− 1.296
	20.4	9.4	− 0.047	.048	1.396		22.9	0.1	.087	.183	1.153
	23.4	8.4	+ 0.052	.088	1.017		23.1	5.5	.120	.183	1.153
	23.6	13.5	.009	.088	1.017		23.3	9.6	.082	.160	1.153
	24.0	1.2	.094	.099	0.832		23.5	14.6	.033	.160	1.153

TABLE B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—Continued.

Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s.	s.	s.
April	23.9	0.1	+ 0.095	− 0.124	− 1.191
	24.0	2.2	.129	.124	1.191
	24.1	4.7	.141	.124	1.191
	25.3	9.4	.083	.223	1.111
	25.5	13.2	.050	. .	1.111
	25.6	17.0	+ 0.030	− 0.180	− 1.111
May	1.4	13.0	− 0.010	.154	1.609
	1.5	15.5	− 0.008	.154	1.609
	2.5	15.1	+ 0.001	.044	1.643
	2.7	20.0	− 0.012	.024	1.643
	3.7	20.3	− 0.001	− 0.057	− 1.523
	3.8	21.5	− 0.001	.057	1.523
	3.9	0.0	+ 0.035	.078	1.523
	3.9	1.2	.056	. .	1.523
	4.1	5.6	+ 0.089	.110	1.523
	6.7	20.6	− 0.007	− 0.096	− 1.519
	6.9	0.6	+ 0.042	.089	1.428
	6.9	1.2	.051	.089	1.428
	6.9	1.9	.058	. .	1.428
	9.9	2.1	.048	.096	1.542
	10.0	3.2	+ 0.057	− 0.096	− 1.542
	10.9	0.6	.037	. .	1.576
	10.9	1.2	.050	.075	1.576
	11.0	3.2	.063	. .	1.576
	11.1	6.2	.064	.087	1.576
	12.3	11.4	+ 0.048	− 0.162	− 1.616
	12.4	13.2	.038	. .	1.616
	12.4	15.0	.023	.162	1.616
	14.3	11.0	.085	.144	1.403
	14.6	16.8	.056	.144	1.403
	14.9	1.2	+ 0.093	− 0.149	− 1.164
	15.0	3.5	.119	. .	1.164
	15.1	6.6	.143	.147	1.164
	15.4	13.2	.101	.180	1.164
	15.5	16.0	.085	. .	1.164
	15.6	18.5	+ 0.080	− 0.138	− 1.164
	16.9	1.2	.125	.194	0.564
	17.0	3.9	.158	.194	0.564
	17.1	5.1	.173	. .	0.564
	17.4	12.8	.132	.164	0.564
1877.	d.	h.	s.	s.	s.
May	17.6	17.0	+ 0.101	− 0.164	− 0.564
	17.9	1.2	.137	.114	0.153
	17.9	2.8	.160	.114	0.153
	18.0	3.7	.170	.114	0.153
	18.1	5.7	.191	.114	0.153
	18.3	9.1	+ 0.182	− 0.183	− 0.153
	18.4	14.1	.128	. .	0.153
	18.6	17.8	.114	.183	− 0.153
	21.9	1.2	.137	.058	+ 0.508
	21.9	2.3	.151	− 0.058	0.508
	22.4	12.8	+ 0.097	+ 0.020	+ 0.508
	22.5	15.8	.097	.020	0.508
	22.9	1.2	.086	.056	0.069
	23.3	12.0	.080	. .	0.069
	23.4	13.2	.068	.071	0.069
	23.5	16.1	+ 0.043	+ 0.092	+ 0.069
	24.4	13.2	.025	− 0.047	− 0.673
	24.5	16.8	.012	+ 0.004	0.673
	25.9	1.2	.067	− 0.040	0.938
	25.9	3.1	.088	.040	0.938
	27.9	1.2	+ 0.084	− 0.102	− 0.920
	28.0	4.4	.113	. .	0.920
	28.1	6.9	.130	.167	0.920
	28.4	12.8	.088	.024	0.920
	28.6	18.2	.059	.094	0.920
	29.3	12.2	+ 0.108	− 0.093	− 1.012
	29.3	13.2	.100	.093	1.012
	31.3	13.2	.118	.111	0.891
	31.5	15.5	.092	.083	0.891
	31.6	19.8	.070	. .	0.891
	31.6	20.2	. .	− 0.062	− 0.891
	31.9	1.8	+ 0.105	. .	0.975
	31.9	2.7	. .	.117	0.975
June	1.0	4.6	.146	. .	0.975
	1.1	7.5	.164	.132	0.975
	1.4	13.2	+ 0.122	− 0.144	− 0.975
	1.5	16.9	.099	.138	0.975
	7.9	2.9	.126	.055	0.532
	8.0	5.1	.152	.055	0.532
	11.4	13.2	.088	.117	0.782

TABLE B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—Continued.

Month and Day.		Sidereal Hour.	*c*	*b*	*a*	Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s.	s.	s.	1877.	d.	h.	s.	s.	s.
June	11.5	16.7	+ 0.079	− 0.117	− 0.782	July	6.5	18.4	+ 0.101	. .	− 0.660
	12.9	3.7	.126	.163	.938		6.7	23.9	.080	− 0.076	.660
	13.0	5.5	.145	.163	.938		6.9	4.5	.120	. .	.906
	14.5	16.2	.117	.135	.442		6.9	5.4	. .	.218	.906
	14.6	18.0	.112	.135	− 0.442		7.0	7.1	.142	. .	.906
	18.9	4.6	+ 0.166	− 0.055	+ 0.060		7.1	9.8	. .	− 0.107	− 0.906
	19.1	7.9	.185	.055	.060		7.1	10.2	+ 0.146	. .	.906
	19.4	14.4	.147	. .	.060		7.3	15.0	.126	. .	.906
	19.4	15.6	. .	.079	.060		7.4	16.0	. .	.123	.906
	19.5	18.4	.125	. .	.060		7.4	17.4	.108	. .	.906
	19.5	18.8	. .	− 0.014	+ 0.060		7.5	19.0	. .	− 0.114	− 0.906
	19.9	3.7	+ 0.131	. .	− 0.145		7.5	19.7	+ 0.100	. .	.906
	19.9	4.7	. .	+ 0.001	.145		8.4	17.4	.120	.106	.710
	20.0	6.0	.153	. .	.145		8.5	19.5	.116	.106	.710
	20.1	7.6	.157	.045	.145		11.9	4.8	.122	.129	.748
	20.3	14.0	+ 0.124	+ 0.048	− 0.145		12.0	7.2	+ 0.140	− 0.129	− 0.748
	20.4	15.8	.114	+ 0.048	.145		12.4	16.3	.111	+ 0.017	.748
	22.4	16.6	.078	− 0.072	.497		12.6	21.3	.084	+ 0.017	.748
	22.5	18.5	.071	.072	.497		12.9	4.5	.114	− 0.096	.946
	22.6	19.8	.056	.072	.497		13.0	7.5	.149	.096	.946
	22.9	3.3	+ 0.081	− 0.064	− 0.866		13.1	10.3	+ 0.161	− 0.096	− 0.946
	22.9	5.0	.103	. .	.866		13.3	15.2	.120	. .	.946
	23.0	6.2	.106	. .	.866		13.4	16.1	. .	.127	.946
	23.1	8.2	.117	.077	.866		13.4	18.2	.100	. .	.946
	23.3	14.0	.100	.019	.866		13.6	21.7	. .	.009	.946
	23.5	19.0	+ 0.076	− 0.019	− 0.866		14.4	16.3	+ 0.121	. .	− 0.978
	25.4	16.5	.118	.070	.498		14.4	18.2	.110	− 0.131	.978
	25.5	18.2	.114	. .	.498		14.5	19.8	.104	. .	.978
	25.5	19.0	.115	.099	.498		14.6	21.3	.100	.153	.978
	25.9	5.1	.175	.099	.620		15.2	12.0	.176	.153	.874
	26.0	6.4	+ 0.180	− 0.099	− 0.620		15.3	13.8	+ 0.170	− 0.153	− 0.874
	28.4	16.4	.080	.001	.550		16.3	14.2	.168	. .	.701
	28.5	18.5	.072	.001	.550		16.3	15.3	. .	.058	.701
	29.4	16.5	.104	.084	.892		16.5	18.4	.144	. .	.701
	29.5	19.7	.090	.084	− 0.892		16.5	19.5	. .	.086	.701
	29.6	22.1	+ 0.084	− 0.084	+ 0.892		24.4	18.2	+ 0.120	− 0.090	− 0.633
July	1.7	0.1	. .	.046	.359		26.4	17.0	.170	. .	.564
	1.8	0.8	.119	. .	.359		26.4	18.2	.160	.104	.564
	1.8	1.0	. .	.108	.359		26.5	19.8	.154	. .	.564
	6.4	16.5	.107	.076	.660		26.6	22.0	.150	.114	.564

TABLE B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—Continued.

Month and Day.		Sidereal Hour.	*c*	*b*	*a*	Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s.	s.	s.	1877.	d.	h.	s.	s.	s.
July	27.9	6.3	+ 0.158	− 0.133	− 0.631	August	17.5	22.3	. .	− 0.062	− 1.137
	28.0	8.5	.182	.133	.631		18.4	17.5	+ 0.159	. .	.130
	29.5	21.7	.127	. .	.567		18.5	21.8	. .	.100	.130
	29.6	22.0	. .	.086	.567		18.6	0.1	.128	. .	.130
	29.7	1.9	.120	. .	.567		18.6	0.5	. .	.135	.130
	29.7	2.2	. .	− 0.085	− 0.567		20.4	18.7	+ 0.156	. .	− 1.181
	29.9	6.2	+ 0.154	. .	.458		20.4	19.2	. .	− 0.077	.181
	29.9	7.1	.160	. .	.458		20.5	21.6	.144	. .	.181
	29.9	7.8	. .	.052	.458		20.5	22.0	. .	.072	.181
	30.0	8.7	.168	. .	.458		21.3	18.0	.166	. .	.174
	30.1	9.9	+ 0.172	− 0.022	− 0.458		21.3	18.3	. .	− 0.116	− 1.174
	30.1	11.7	.176	. .	.458		21.6	23.9	+ 0.138	. .	.174
	30.3	16.7	. .	.020	.458		27.4	18.2	.180	. .	.174
	30.3	17.0	.142	. .	.458		27.4	19.5	. .	.094	.174
	30.5	21.0	.126	. .	.458		27.6	0.3	.153	. .	.174
	30.5	21.3	. .	− 0.070	− 0.458		28.4	19.3	+ 0.184	. .	− 1.165
	30.6	22.8	+ 0.121	. .	.458		28.4	21.1	. .	− 0.102	.165
	30.7	1.3	.115	.041	.458		28.5	23.8	.161	. .	.165
	30.7	1.7	. .	.041	0.458		30.3	18.7	.180	. .	.020
August	3.7	2.6	.097	.136	1.047		30.4	19.2	. .	.091	.020
	3.8	5.0	+ 0.110	− 0.136	− 1.047		30.4	21.2	. .	− 0.120	− 1.020
	9.4	19.0	.154	. .	.112		30.4	21.3	+ 0.168	. .	.020
	9.5	20.6	. .	.254	.112	September	1.4	19.5	.164	. .	.196
	9.5	21.6	.144	. .	.112		1.5	22.0	. .	.092	.196
	9.9	7.2	.172	. .	.078		1.6	23.9	.139	. .	.196
	10.0	8.9	. .	− 0.173	− 1.078		1.6	0.6	. .	− 0.066	− 1.196
	10.0	9.4	+ 0.188	. .	.078		3.4	19.7	+ 0.114	. .	.207
	10.1	11.7	.200	. .	.078		3.4	21.6	. .	+ 0.025	.207
	10.4	18.2	.148	. .	.078		3.5	0.1	.096	. .	.207
	10.5	21.1	. .	.092	.078		4.4	20.0	.133	. .	.458
	10.5	21.3	+ 0.140	. .	− 1.078		4.4	20.4	. .	− 0.059	− 1.458
	11.4	18.5	.157	. .	.146		4.5	22.4	. .	.059	.458
	11.4	20.0	. .	− 0.178	.146		12.3	19.5	+ 0.145	. .	.282
	11.5	20.6	.154	. .	1.146		12.4	21.4	. .	−0 .030	.282
	15.9	7.4	.164	. .	0.971		18.3	19.7	.112	. .	.386
	15.9	8.0	. .	− 0.112	− 0.971		18.4	21.0	. .	+ 0.012	− 1.386
	15.9	8.3	+ 0.172	. .	0.971		18.4	21.6	+ 0.101	. .	.386
	17.4	17.2	.154	. .	1.137		21.3	20.1	.105	. .	.661
	17.4	20.0	. .	.075	.137		21.4	22.4	. .	− 0.091	.661
	17.5	21.9	.140	. .	.137		21.5	0.0	. .	.054	.661

Table B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—**Continued.**

Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s.	s.	s.
September	21.5	0.1	+ 0.081	. .	− 1.661
	22.3	19.7	.099	. .	.651
	22.3	20.0	. .	− 0.036	.651
	22.5	23.4	.074	. .	.651
	22.5	23.5	. .	.075	.651
	24.3	20.8	+ 0.116	. .	− 1.596
	24.4	21.8	. .	− 0.050	.596
	24.5	23.3	.101	. .	.596
	25.3	20.0	.143	. .	.618
	25.3	20.1	. .	.115	.618
	25.4	21.2	. .	− 0.052	− 1.618
	25.4	21.5	+ 0.134	. .	.618
	26.3	19.8	.146	. .	.513
	26.4	22.2	. .	− 0.120	.513
	26.5	1.2	.112	. .	.513
October	1.3	20.0	+ 0.133	. .	− 1.299
	1.3	20.1	. .	+ 0.026	.299
	1.4	22.3	. .	− 0.115	.299
	1.5	0.1	.105	. .	.299
	2.3	20.8	.136	. .	.478
	2.4	22.8	. .	− 0.020	− 1.478
	2.5	1.2	+ 0.106	. .	.478
	4.9	10.2	.085	. .	.842
	5.0	12.2	.098	. .	.842
	5.0	12.5	. .	.043	.842
	5.0	13.2	+ 0.100	. .	− 1.842
	5.1	15.5	.108	− 0.035	.842
	5.3	19.8	.078	. .	.842
	5.3	21.2	.073	. .	.842
	5.4	21.4	. .	− 0.054	.842
	5.5	0.8	. .	+ 0.001	− 1.842
	6.3	20.4	+ 0.073	. .	.834
	6.3	21.0	. .	− 0.095	.834
	6.5	23.9	. .	.081	.834
	6.5	1.2	.061	. .	.834
	10.3	20.3	+ 0.116	. .	− 1.846
	10.3	20.7	. .	− 0.070	.846
	11.3	21.1	.069	. .	. .
	11.4	21.8	. .	.086	. .
	11.4	23.7	. .	.078	.680
1877. October	11.5	0.1	+ 0.065	. .	− 1.680
	12.2	18.4	.086	. .	.724
	12.2	19.9	. .	+ 0.069	.724
	12.4	23.0	. .	− 0.008	.724
	12.4	0.1	.057	. .	.724
	12.9	11.4	+ 0.076	. .	− 1.986
	12.9	11.6	. .	− 0.036	.986
	13.0	13.3	.096	. .	.986
	13.1	15.9	.112	. .	.986
	13.1	16.4	. .	.032	.986
	13.3	20.1	+ 0.084	. .	− 1.986
	13.3	20.5	. .	− 0.146	.986
	13.5	1.6	. .	.016	.986
	13.5	1.7	.066	. .	.986
	14.3	20.3	.125	. .	.741
	14.3	21.7	. .	− 0.017	− 1.741
	14.5	1.2	+ 0.095	+ 0.036	.741
	15.3	21.1	.126	. .	.777
	15.3	21.8	. .	− 0.089	.777
	15.4	0.3	. .	.067	.777
	15.5	1.2	+ 0.108	. .	− 1.777
	16.3	20.9	.144	. .	.760
	16.4	22.1	.126	. .	.760
	16.4	22.8	. .	− 0.028	.760
	18.3	21.4	. .	.026	.666
	18.3	21.8	+ 0.117	. .	− 1.666
	18.5	1.2	.109	. .	.666
	18.6	3.0	.108	. .	.666
	18.6	3.5	. .	− 0.026	.666
	22.3	21.0	.066	. .	.831
	22.4	0.5	. .	− 0.018	− 1.831
	22.4	0.8	+ 0.051	. .	.831
	22.5	2.9	.048	. .	.831
	22.9	11.7	.078	. .	.782
	22.9	13.2	.104	+ 0.064	.782
	23.3	21.4	+ 0.084	. .	− 1.782
	23.3	22.2	. .	+ 0.005	.782
	23.5	1.2	.072	. .	.782
	23.5	2.5	. .	.017	.782
	23.6	3.4	.068	. .	.782

Table B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—Continued.

Month and Day.		Sidereal Hour.	*c*	*b*	*a*	Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s.	s.	s.	1877.	d.	h.	s.	s.	s.
October	24.3	21.6	. .	+ 0.024	− 1.816	November	12.1	18.8	+ 0.079	— 0.048	− 0.820
	24.3	22.0	+ 0.104	. .	.816		12.2	21.0	.057	. .	.820
	24.5	1.2	.088	. .	.816		12.4	0.2	. .	.087	.820
	24.6	5.0	.074	. .	.816		12.4	1.2	.028	. .	.820
	24.6	5.4	. .	− 0.020	.816		12.5	3.1	.016	. .	.820
	31.3	21.6	+ 0.068	. .	− 1.787		12.9	13.2	+ 0.033	. .	− 0.936
	31.4	0.3	. .	− 0.070	.787		12.9	15.3	.074	. .	.936
	31.4	1.2	.042	. .	.787		13.0	16.4	. .	− 0.125	.936
	31.5	2.3	.040	. .	.787		13.1	18.5	.094	. .	.936
	31.9	13.2	.076	. .	.652		13.3	21.9	.060	. .	.936
	31.9	13.3	. .	+ 0.058	− 1.652		13.4	1.2	+ 0.041	. .	— 0.936
November	1.0	14.4	+ 0.084	. .	.652		13.5	2.3	. .	+ 0.077	.936
	1.1	17.5	.096	.018	.652		13.5	4.2	.018	. .	.936
	2.3	23.0	.069	. .	.848		15.9	13.2	.106	. .	.732
	2.4	0.3	. .	.006	.848		15.9	14.3	. .	— 0.055	.732
	2.6	4.8	+ 0.047	. .	− 1.848		16.0	15.5	+ 0.119	. .	− 0.732
	2.6	5.0	. .	+ 0.028	.848		16.2	21.6	.096	. .	.732
	2.9	13.2	.073	. .	.883		16.4	1.0	. .	+ 0.040	.732
	2.9	14.6	.082	. .	.883		16.4	1.2	.060	. .	.732
	3.0	15.9	. .	− 0.004	.883		16.5	3.1	.059	. .	.732
	3.1	17.7	+ 0.079	. .	− 1.883		16.9	13.2	+ 0.061	. .	− 0.692
	3.3	23.0	.044	. .	.883		17.1	17.2	. .	— 0.001	.692
	3.4	0.8	. .	− 0.009	.883		17.1	17.7	.112	. .	.692
	3.4	1.2	.036	. .	.883		17.3	22.8	.090	. .	.692
	3.5	2.8	. .	.036	.883		17.4	1.8	.073	. .	.692
	3.5	3.1	+ 0.018	. .	− 1.883		17.4	2.0	. .	+ 0.017	− 0.692
	6.9	13.2	.026	. .	.878		18.9	13.2	+ 0.016	. .	.997
	7.0	14.9	.040	. .	.878		18.9	13.9	. .	.072	.997
	7.1	16.0	. .	— 0.070	.878		18.9	15.8	.035	. .	.997
	7.1	18.2	.058	. .	.878		19.1	18.2	.049	. .	.997
	7.3	21.9	+ 0.033	. .	− 1.878		19.1	18.8	. .	+ 0.071	− 0.997
	7.4	1.2	.021	. .	.878		19.3	22.6	. .	.041	.997
	7.5	2.0	. .	− 0.106	.878		19.3	23.1	+ 0.018	. .	.997
	7.5	3.1	.019	. .	− 1.878		19.4	1.2	+ 0.006	. .	.997
	11.2	20.9	.030	. .	− 0.853		19.5	4.2	− 0.004	.054	0.997
	11.3	22.0	. .	− 0.092	− 0.853		19.9	13.2	+ 0.012	. .	− 1.026
	11.3	23.1	+ 0.015	. .	.853		19.9	14.2	.034	. .	.026
	11.9	13.2	.030	. .	.820		19.9	14.3	. .	+ 0.075	.026
	11.9	14.0	. .	.090	.820		19.9	15.8	.046	. .	.026
	12.0	15.2	.058	. .	.820		20.1	18.3	. .	.191	.026

TABLE B.—*Adopted Values of the Collimation, Level, and Azimuth Constants*—Continued.

Month and Day.		Sidereal Hour.	*c*	*b*	*a*	Month and Day.		Sidereal Hour.	*c*	*b*	*a*
1877.	d.	h.	s.	s.	s.	1877.	d.	h.	s.	s.	s.
November	20.1	19.1	+ 0.056	. .	− 1.026	December	10.3	0.3	. .	+ 0.055	− 0.808
	20.2	21.6	.032	. .	.261		10.3	1.2	+ 0.022	. .	.808
	20.4	0.9	. .	+ 0.076	.261		10.4	2.2	.013	. .	.808
	20.4	1.2	.014	. .	.261		11.3	23.9	.070	. .	.822
	20.5	4.0	.002	. .	1.261		11.3	1.2	.074	. .	.822
	27.6	6.7	+ 0.040	. .	+ 0.032		11.4	2.9	+ 0.052	. .	− 0.822
	27.7	7.8	.037	. .	.032		11.4	4.2	. .	+ 0.100	.822
	27.7	9.0	. .	+ 0.243	.032		11.6	7.3	.026	. .	.822
	27.8	10.3	.024	. .	+ 0.032		13.9	14.7	.020	. .	.830
December	2.9	15.0	.003	. .	− 1.190		13.9	15.6	. .	.038	.830
	2.9	16.1	. .	+ 0.219	− 1.190		14.0	17.5	+ 0.038	. .	− 0.830
	2.9	16.7	+ 0.022	. .	.190		14.0	18.2	.050	. .	.830
	3.0	17.0	.024	. .	.190		14.1	20.6	. .	+ 0.135	.830
	3.1	18.2	.034	. .	.190		14.1	20.9	.058	. .	.830
	3.1	19.1	. .	.153	.190		14.2	23.0	.041	. .	.830
	3.1	20.1	+ 0.035	. .	− 1.190		14.3	1.6	+ 0.016	. .	− 0.830
	3.2	22.8	.014	. .	.190		14.4	2.4	. .	+ 0.092	.830
	3.4	1.2	+ 0.005	+ 0.195	.190		14.5	4.6	.006	. .	.830
	3.5	4.0	− 0.006	. .	.190		14.9	16.1	.020	. .	.965
	3.6	6.2	.006	. .	.190		15.0	17.6	.038	. .	.965
	3.6	7.8	− 0.010	+ 0.190	− 1.190		15.1	19.4	. .	+ 0.120	− 0.965
	6.2	23.3	+ 0.024	. .	0.617		15.1	21.1	+ 0.072	. .	.965
	6.3	0.8	.020	. .	.617		15.2	23.0	.053	. .	.965
	6.3	1.0	. .	.161	.617		15.3	1.4	. .	.061	.965
	7.9	15.6	.020	. .	.673		15.4	2.5	.042	. .	.965
	8.1	19.0	. .	+ 0.086	− 0.673		17.9	15.2	+ 0.032	. .	− 0.766
	8.2	20.9	+ 0.060	. .	.673		18.0	17.8	.054	. .	.766
	8.3	23.4	.034	. .	.673		18.0	18.6	. .	+ 0.070	.766
	8.3	1.2	.015	. .	.673		18.1	21.1	.046	. .	.766
	8.4	1.7	. .	.188	.673		18.4	2.3	.022	. .	.766
	8.5	5.3	+ 0.006	. .	− 0.673		18.4	3.4	. .	+ 0.066	− 0.766
	9.1	20.6	+ 0.016	. .	.800		18.4	4.5	+ 0.023	. .	.766
	9.2	21.8	. .	+ 0.170	.800		19.4	3.9	.030	. .	.830
	9.3	23.6	− 0.004	. .	.800		19.5	6.6	.021	+ 0.106	0.830
	10.2	22.0	+ 0.041	. .	.808		30.9	18.5	+ 0.014	− 0.017	1.722
							31.4	3.3	− 0.001	+ 0.029	1.378

TABLE C.—*Adopted Corrections to the Right Ascensions of the Clock Stars in the American Ephemeris for the year* 1877.

	s.		s.		s.
α Andromedæ	+ 0.03	ε Leonis	− 0.03	μ¹ Sagittarii	+ 0.03
γ Pegasi	+ 0.01	μ Leonis	+ 0.04	η Serpentis	+ 0.10
β Ceti	+ 0.06	α Leonis	− 0.04	1 Aquilæ	+ 0.08
ε Piscium	− 0.01	γ¹ Leonis	+ 0.02	α Lyræ	+ 0.03
θ¹ Ceti	0.00	ρ Leonis	− 0.04	β Lyræ	+ 0.04
η Piscium	+ 0.08	l Leonis	+ 0.03	σ Sagittarii	0.00
ο Piscium	− 0.05	δ Leonis	− 0.05	ζ Aquilæ	+ 0.11
β Arietis	+ 0.02	δ Crateris	0.00	d Sagittarii	+ 0.03
α Arietis	+ 0.01	τ Leonis	− 0.03	δ Aquilæ	+ 0.07
γ Ceti	− 0.01	υ Leonis	− 0.03	κ Aquilæ	+ 0.04
α Ceti	+ 0.01	β Leonis	− 0.01	γ Aquilæ	+ 0.03
ζ Arietis	0.00	ο Virginis	− 0.04	α Aquilæ	+ 0.04
α Persei	+ 0.08	η Virginis	− 0.01	β Aquilæ	+ 0.04
δ Persei	+ 0.17	β Corvi	+ 0.01	τ Aquilæ	+ 0.03
η Tauri	+ 0.01	12 Canum Venaticorum	+ 0.03	α² Capricorni	+ 0.06
ζ Persei	+ 0.02	θ Virginis	− 0.04	π Capricorni	+ 0.04
γ¹ Eridani	+ 0.03	α Virginis	− 0.03	ε Delphini	+ 0.06
γ Tauri	+ 0.02	ζ Virginis	− 0.01	α Cygni	+ 0.04
ε Tauri	+ 0.01	η Ursæ Majoris	− 0.02	μ Aquarii	+ 0.07
α Tauri	− 0.01	η Bootis	− 0.04	ν Cygni	+ 0.04
ι Aurigæ	+ 0.02	α Bootis	+ 0.02	61¹ Cygni	− 0.01
11 Orionis	− 0.08	ϑ Bootis	+ 0.08	ζ Cygni	+ 0.03
α Aurigæ	− 0.01	ε Bootis	+ 0.01	1 Pegasi	− 0.06
β Orionis	0.00	α² Libræ	0.00	β Aquarii	+ 0.01
β Tauri	+ 0.01	β Bootis	+ 0.03	ξ Aquarii	0.00
δ Orionis	− 0.03	β Libræ	0.00	μ Capricorni	0.00
α Leporis	− 0.06	μ¹ Bootis	− 0.04	α Aquarii	+ 0.02
ε Orionis	0.00	α Coronæ Borealis	+ 0.01	ϑ Aquarii	+ 0.02
α Columbæ	− 0.02	α Serpentis	+ 0.03	π Aquarii	+ 0.03
α Orionis	− 0.02	ε Serpentis	− 0.01	η Aquarii	+ 0.04
μ Geminorum	− 0.02	ε Coronæ Borealis	− 0.04	ζ Pegasi	+ 0.09
γ Geminorum	− 0.03	δ Scorpii	+ 0.03	λ Aquarii	+ 0.10
α Canis Majoris	+ 0.05	β¹ Scorpii	+ 0.06	α Piscis Australis	+ 0.01
ε Canis Majoris	− 0.05	δ Ophiuchi	+ 0.02	g Pegasi	+ 0.02
δ Canis Majoris	− 0.05	τ Herculis	+ 0.16	ϑ Piscium	+ 0.05
δ Geminorum	− 0.04	α Scorpii	− 0.02	ι Piscium	− 0.03
α² Geminorum	+ 0.30	ζ Ophiuchi	0.00	ω Piscium	0.00
α Canis Minoris	− 0.10	η Herculis	0.00		
β Geminorum	− 0.02	κ Ophiuchi	+ 0.07		
φ Geminorum	− 0.06	d Herculis	+ 0.19		
15 Argus	− 0.07	α¹ Herculis	+ 0.02		
ε Hydræ	− 0.05	44 Ophiuchi	+ 0.03		
ι Ursæ Majoris	− 0.01	α Ophiuchi	+ 0.04		
κ Cancri	+ 0.03	μ Herculis	+ 0.04		
α Hydræ	− 0.02	γ³ Sagittarii	− 0.01		

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock No.* 1324 *in* 1877.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		h.	s.	s.	1877.		h.	s.	s.
Jan. 23.9	E.	18.65	− 0.570	+ 0.039	Feb. 6.3	F.	6.50	+ 17.737	+ 0.048
24.1	E.	22.90	− 0.405		6.4	F.	7.50	+ 17.785	+ 0.082
24.3	E.	3.80	− 0.210	+ 0.078	6.5	F.	9.83	+ 17.977	
24.4	E.	6.70	+ 0.015		6.9	S.	19.30	+ 18.780	+ 0.057
24.9	F.	17.58	+ 0.400	− 0.006	7.1	S.	23.00	+ 18.990	
24.9	F.	19.25	+ 0.390		7.3	S.	5.27	+ 19.663	+ 0.048
25.3	F.	3.83	− 0.726	+ 0.069	7.5	S.	9.93	+ 19.887	+ 0.040
25.4	F.	5.03	− 0.643		7.8	S.	16.03	+ 20.133	
25.9	S.	17.90	+ 0.240	+ 0.018	7.9	P.	18.98	+ 20.202	+ 0.039
26.1	S.	21.90	+ 0.310		8.1	P.	23.98	+ 20.398	+ 0.074
26.3	S.	4.50	+ 0.867	+ 0.064	8.3	P.	5.27	+ 20.787	
26.5	S.	9.18	+ 1.168		8.9	E.	20.60	+ 21.910	+ 0.084
26.9	P.	18.77	+ 1.310	+ 0.047	9.1	E.	0.23	+ 22.213	
27.1	P.	22.80	+ 1.500		9.3	E.	5.27	+ 22.667	+ 0.056
27.4	P.	7.07	+ 2.030	+ 0.075	9.5	E.	9.03	+ 22.877	
27.6	P.	10.77	+ 2.305		9.9	F.	19.37	+ 23.633	+ 0.044
28.4	E.	5.80	+ 3.760	+ 0.050	10.1	F.	23.72	+ 23.825	
28.4	E.	7.28	+ 3.833		10.3	F.	5.27	+ 24.230	+ 0.074
28.9	F.	19.17	+ 4.468	+ 0.060	10.5	F.	9.46	+ 24.540	
29.1	F.	23.57	+ 4.733		12.1	P.	0.33	+ 27.000	
29.3	F.	3.80	+ 4.993	+ 0.174	12.9	E.	18.77	+ 27.427	− 0.001
29.4	F.	5.25	+ 5.245		13.1	E.	0.23	+ 27.423	
29.9	S.	18.50	+ 6.325	+ 0.029	13.3	E.	6.50	+ 27.587	+ 0.002
30.1	S.	22.07	+ 6.430		13.5	E.	10.00	+ 27.593	
30.3	S.	5.27	+ 7.077	+ 0.059	14.3	F.	5.43	+ 27.683	+ 0.025
30.4	S.	7.07	+ 7.183	+ 0.115	14.4	F.	7.70	+ 27.740	+ 0.022
30.6	S.	9.93	+ 7.513		14.5	F.	10.10	+ 27.790	
30.9	E.	18.75	+ 7.795	+ 0.018	14.9	S.	19.70	+ 28.145	− 0.011
31.1	E.	21.30	+ 7.840		15.1	S.	23.52	+ 28.103	
Feb. 3.4	S.	6.85	+ 13.302	+ 0.075	15.3	S.	5.27	+ 28.303	+ 0.009
3.5	S.	9.80	+ 13.525		15.5	S.	9.87	+ 28.343	
5.9	F.	19.22	+ 16.988	+ 0.070	15.9	P.	18.70	+ 28.162	
6.1	F.	0.05	+ 17.325		16.9	E.	20.00	+ 28.407	+ 0.026
6.3	F.	4.90	+ 17.600	+ 0.086	17.1	E.	0.23	+ 28.517	

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		h.	s.	s.	1877.		h.	s.	s.
Feb. 17.3	E.	6.53	+ 28.720	− 0.005	Mar. 23.4	S.	8.76	− 22.952	0.000
17.5	E.	9.80	+ 28.703		23.5	S.	12.77	− 22.953	
19.4*	S.	7.07	− 30.703	+ 0.016	24.1	P.	1.90	− 23.010	
19.5	S.	10.00	− 30.655		24.5	P.	11.27	− 22.897	+ 0.002
20.1	P.	0.23	− 30.913	+ 0.030	24.5	P.	13.07	− 22.893	
20.3	P.	4.72	− 30.780	− 0.021	29.3	E.	9.80	− 21.585	+ 0.012
20.6	P.	12.68	− 30.944		29.4	E.	11.86	− 21.560	
20.9	E.	19.57	− 30.767	− 0.020	30.1	F.	2.03	− 21.358	+ 0.001
21.1	E.	0.87	− 30.875		30.4	F.	9.55	− 21.352	+ 0.038
21.3	E.	5.40	− 30.884	+ 0.015	30.5	F.	13.08	− 21.218	
21.5	E.	9.85	− 30.818		April 5.4	P.	9.93	− 18.663	+ 0.032
25.4	E.	7.07	− 30.213	+ 0.051	5.5	P.	12.80	− 18.570	
25.4	E.	9.03	− 30.113		5.9	E.	23.00	− 18.487	+ 0.029
27.5	S.	10.10	− 29.315	− 0.226	6.3	E.	9.03	− 18.197	+ 0.029
27.5	S.	11.45	− 29.620		6.8	E.	20.73	− 17.857	
27.9	P.	21.57	− 29.707	− 0.007	6.9	F.	0.05	− 17.970	+ 0.021
28.1	P.	1.45	− 29.735		7.1	F.	4.34	− 17.878	+ 0.021
28.4	P.	9.55	− 29.478	− 0.002	7.4	F.	11.61	− 17.726	
28.6	P.	13.40	− 29.470		10.9	F.	23.90	− 16.190	+ 0.020
28.9	E.	20.40	− 29.628		11.1	F.	4.33	− 16.100	
Mar. 2.9	S.	19.70	− 29.080	+ 0.017	11.3	F.	9.66	− 16.160	+ 0.002
3.1	S.	1.90	− 28.975		11.5	F.	13.63	− 16.153	
5.9	S.	21.52	− 28.182	+ 0.027	11.9	S.	22.80	− 15.713	− 0.002
6.1	S.	0.23	− 28.110		12.1	S.	3.80	− 15.723	
7.5	S.	10.92	− 27.402	+ 0.028	12.4	S.	10.55	− 15.520	+ 0.012
7.6	S.	12.80	− 27.350		12.5	S.	13.40	− 15.485	
9.3	E.	9.03	− 27.127	+ 0.127	14.3	E.	9.67	− 14.803	− 0.008
9.4	E.	9.93	− 27.013		14.5	E.	12.60	− 14.827	
14.9	P.	22.20	− 25.267	+ 0.013	20.3	S.	9.03	− 13.137	+ 0.039
15.1	P.	1.73	− 25.220		20.3	S.	9.90	− 13.103	
15.4	P.	9.20	− 25.138	+ 0.016	21.3	P.	9.50	− 13.140	+ 0.017
15.7	P.	16.04	− 25.030		21.5	P.	13.40	− 13.075	
20.1	F.	2.88	− 23.880	+ 0.018	22.3	E.	10.30	− 12.593	− 0.006
20.4	F.	8.63	− 23.777		22.5	E.	12.92	− 12.608	

* Clock set forward about one minute.

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—**Continued.**

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		h.	s.	s.	1877.		h.	s.	s.
April 22.9	F.	0.75	− 12.540		May 17.5	F.	15.92	− 9.978	
				− 0.014					
23.1	F.	5.06	− 12.600		17.9	S.	1.80	− 9.930	
									+ 0.032
23.3	F.	9.70	− 12.480		18.1	S.	5.27	− 9.820	
				− 0.030					
23.4	F.	11.70	− 12.540		18.3	S.	9.90	− 9.660	
									+ 0.016
23.9	S.	0.35	− 12.320		18.4	S.	13.53	− 9.603	
				+ 0.020					+ 0.024
24.1	S.	4.20	− 12.247		18.5	S.	16.63	− 9.530	
25.3	P.	9.90	− 12.280		21.9	S.	1.80	− 9.187	
				− 0.002					
25.6	P.	16.50	− 12.294		22.4	S.	13.30	− 9.097	
									− 0.056
May 1.4	F.	14.00	− 11.330		22.5	S.	16.17	− 9.257	
				− 0.061					
1.5	F.	15.40	− 11.415		22.9	P.	2.00	− 9.42	
2.5	S.	13.88	− 11.238		23.3	P.	12.38	− 9.462	
				+ 0.022					− 0.052
2.5	S.	15.60	− 11.200		23.5	P.	16.17	− 9.657	
				− 0.032					
2.7	S.	19.70	− 11.330		24.3	E.	14.35	− 9.242	
									− 0.053
3.7	P.	20.63	− 11.667		24.4	E.	16.37	− 9.350	
				+ 0.036					
3.8	P.	21.10	− 11.650		25.9	S.	1.60	− 9.430	
									− 0.117
3.9	E.	0.23	− 11.697		25.9	S.	2.50	− 9.535	
				− 0.012					
4.1	E.	5.57	− 11.760		27.9	E.	2.45	− 9.865	
									+ 0.100
6.8	S.	21.18	− 11.125		28.1	E.	6.50	− 9.660	
				+ 0.006					
6.9	S.	23.48	− 11.112		28.4	E.	13.30	− 9.786	
									+ 0.051
6.9	P.	1.47	− 11.507		28.5	E.	15.46	− 9.676	
				− 0.024					− 0.007
7.1	P.	3.30	− 11.550		28.6	E.	17.73	− 9.690	
9.9	S.	0.60	− 11.09		29.3	P.	12.50	− 9.760	
									+ 0.005
10.9	P.	1.47	− 11.073		29.4	P.	13.42	− 9.755	
12.3	E.	11.53	− 10.590		31.3	P.	13.30	− 9.884	
				+ 0.007					− 0.031
12.4	E.	14.80	− 10.567		31.4	P.	15.07	− 9.938	
									− 0.013
14.4	S.	11.33	− 9.960		31.6	P.	19.56	− 9.998	
				− 0.009					
14.5	S.	15.60	− 9.998		31.9	E.	1.90	− 9.885	
									− 0.003
14.9	P.	2.17	− 10.357		June 1.1	E.	7.45	− 9.900	
				− 0.038					
15.1	P.	5.78	− 10.495		1.4	E.	13.42	− 9.805	
									− 0.012
15.4	P.	13.18	− 10.258		1.5	F.	16.60	− 9.843	
				+ 0.003					
15.6	P.	17.82	− 10.245		7.9	P.	2.90	− 8.60	
16.9	F.	2.15	− 10.300		11.4	S.	14.48	− 7.778	
				+ 0.036					
17.1	F.	5.10	− 10.195		12.9	E.	3.80	− 7.813	
17.4	F.	13.53	− 10.027		14.5	F.	16.70	− 7.457	
				+ 0.021					+ 0.005

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		s.	s.	s.	1877.		s.	s.	s.
June 14.6	F.	18.77	− 7.447		July 11.9	F.	5.29	− 5.653	
18.9	S.	3.53	− 6.493	+ 0.031	12.4	F.	16.89	− 5.699	0.000
19.1	S.	7.43	− 6.373		12.6	F.	21.00	− 5.697	
19.4	S.	13.13	− 6.373	− 0.016	12.9	S.	4.97	− 5.353	− 0.013
19.6	S.	17.87	− 6.450		13.1	S.	9.40	− 5.410	
19.9	P.	4.00	− 6.600	− 0.033	13.3	S.	15.46	− 5.312	− 0.019
20.1	P.	7.50	− 6.717		13.5	S.	19.98	− 5.398	
20.3	P.	14.63	− 6.677	− 0.003	14.4	P.	16.70	− 5.702	+ 0.010
20.4	P.	15.65	− 6.680		14.5	P.	19.18	− 5.678	− 0.017
22.4	F.	16.28	− 6.648	+ 0.006	14.6	P.	20.60	− 5.702	
22.5	F.	19.32	− 6.630		15.2	E.	12.35	− 5.890	+ 0.082
22.9	S.	4.25	− 6.282	+ 0.023	15.2	E.	13.53	− 5.793	
23.1	S.	7.93	− 6.197		16.2	F.	15.21	− 5.941	− 0.027
23.3	S.	14.00	− 6.160	+ 0.005	16.3	F.	18.14	− 6.019	
23.4	S.	17.38	− 6.142	− 0.028	24.4	F.	18.30	− 8.310	
23.5	S.	18.75	− 6.180		26.4	P.	17.78	− 9.316	− 0.018
25.4	P.	16.92	− 6.356	+ 0.030	26.6	P.	21.66	− 9.386	
25.5	P.	18.77	− 6.303		27.9	F.	6.50	− 9.383	− 0.040
25.9	F.	5.17	− 6.290		27.9	F.	7.05	− 9.405	
28.4	P.	16.50	− 6.067	− 0.037	29.6	S.	22.45	− 9.655	− 0.032
28.5	P.	18.35	− 6.135		29.7	S.	1.20	− 9.744	
29.4	F.	16.87	− 5.803	− 0.060	29.9	P.	6.88	− 10.392	− 0.009
29.5	F.	18.20	− 5.883	+ 0.024	30.1	P.	11.33	− 10.433	
29.6	F.	21.37	− 5.807		30.4	P.	18.05	− 10.535	− 0.006
July 1.8	S.	23.90	− 5.593	+ 0.016	30.5	P.	20.73	− 10.550	− 0.041
1.8	S.	1.00	− 5.575		30.7	P.	0.58	− 10.706	
6.4	P.	16.78	− 5.875	− 0.006	Aug. 3.7	P.	3.38	− 11.924	+ 0.024
6.6	P.	21.65	− 5.905		3.8	P.	4.50	− 11.897	
6.9	E.	4.80	− 5.647	− 0.016	9.4	F.	19.17	− 13.817	− 0.019
7.1	E.	9.90	− 5.370		9.5	F.	21.07	− 13.853	
7.4	E.	15.17	− 5.577	− 0.007	9.9	S.	7.50	− 13.907	− 0.029
7.5	E.	19.63	− 5.610		10.1	S.	11.40	− 14.020	
8.4	F.	18.05	− 5.618	− 0.026	10.4	S.	18.69	− 14.150	− 0.032
8.5	F.	19.88	− 5.665		10.5	S.	20.36	− 14.204	

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		s.	s.	s.	1877.		s.	s.	s.
Aug. 11.4	E.	19.32	− 14.478	+ 0.012	Sept. 24.4	F.	21.10	− 19.048	− 0.008
11.5	E.	20.40	− 14.465		24.4	F.	22.62	− 19.060	
15.9	E.	7.50	− 16.000		25.3	F.	20.57	− 19.005	− 0.019
17.4	S.	18.19	− 16.189	− 0.018	25.4	F.	21.45	− 19.022	
17.5	S.	21.52	− 16.250		26.3	P.	20.49	− 19.077	+ 0.005
18.4	F.	19.13	− 16.685	− 0.001	26.5	P.	0.52	− 19.058	
18.5	F.	21.58	− 16.688	+ 0.070	Oct. 1.3	F.	20.32	− 18.818	− 0.023
18.6	F.	0.05	− 16.515		1.4	F.	23.33	− 18.887	
20.4	S.	18.35	− 16.645	+ 0.001	2.3	P.	20.95	− 18.952	− 0.003
20.5	S.	20.80	− 16.642		2.5	P.	0.72	− 18.965	
21.3	E.	18.35	− 16.865	− 0.004	4.9	S.	11.03	− 18.747	+ 0.005
21.4	E.	20.89	− 16.875	− 0.027	5.1	S.	14.76	− 18.728	
21.6	E.	0.00	− 16.790		5.3	S.	20.94	− 18.640	− 0.019
27.4	S.	18.88	− 16.165	− 0.003	5.4	S.	23.48	− 18.688	
27.4	S.	20.70	− 16.171	+ 0.014	6.3	F.	21.43	− 18.860	− 0.013
27.6	S.	0.05	− 16.125		6.5	F.	23.90	− 18.893	
28.4	E.	19.50	− 16.367	+ 0.017	10.3	S.	20.25	− 19.380	
28.6	E.	0.00	− 16.290		11.3	E.	21.32	− 19.643	+ 0.003
30.4	E.	19.20	− 16.066	− 0.014	11.4	E.	23.75	− 19.635	
30.4	E.	20.95	− 16.090		12.2	F.	19.65	− 20.038	+ 0.032
Sept. 1.4	F.	19.63	− 15.857	− 0.004	12.3	F.	21.30	− 19.985	+ 0.007
1.5	F.	21.58	− 15.865	+ 0.018	12.4	F.	23.90	− 19.967	
1.6	F.	0.23	− 15.817		12.9	S.	11.87	− 19.730	− 0.043
3.4	F.	20.37	− 15.713	− 0.010	13.1	S.	15.23	− 19.875	
3.5	F.	23.28	− 15.742		13.3	S.	20.52	− 19.972	− 0.026
4.4	S.	19.57	− 15.468	− 0.034	13.5	S.	0.10	− 19.886	
4.5	S.	21.90	− 15.547		14.3	P.	20.95	− 20.572	− 0.034
12.4	F.	19.60	− 17.830		14.5	P.	0.18	− 20.682	
18.4	F.	20.46	− 18.367	− 0.033	15.3	E.	21.45	− 20.420	+ 0.037
18.5	F.	21.90	− 18.415		15.4	E.	0.15	− 20.318	
21.4	F.	20.86	− 18.595	− 0.008	16.3	F.	21.50	− 20.570	
21.5	F.	23.48	− 18.615		18.3	P.	22.13	− 20.430	+ 0.003
22.4	F.	19.98	− 18.810	+ 0.008	18.4	P.	1.14	− 20.422	
22.4	F.	23.02	− 18.787		22.3	F.	21.57	− 20.356	− 0.003

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		s.	s.	s.
Oct. 22.5	F.	1.03	− 20.367	
22.9	E.	12.25	− 20.460	+ 0.009
23.3	E.	21.67	− 20.377	− 0.011
23.6	E.	2.87	− 20.433	
24.3	P.	22.43	− 20.692	+ 0.015
24.4	P.	1.50	− 20.647	− 0.003
24.5	P.	4.24	− 20.654	
31.3	E.	21.80	− 21.493	+ 0.015
31.5	E.	1.90	− 21.433	
31.9	P.	13.55	− 21.880	+ 0.030
Nov. 1.1	P.	16.75	− 21.785	
2.3	S.	0.00	− 21.672	− 0.008
2.5	S.	4.16	− 21.704	
2.9	F.	14.00	− 22.035	+ 0.043
3.1	F.	16.88	− 21.912	
3.2	F.	0.10	− 22.068	+ 0.027
3.5	F.	1.78	− 22.022	
6.9	F.	14.00	− 23.315	− 0.012
7.1	F.	17.08	− 23.352	
7.3	F.	23.10	− 23.514	− 0.002
7.5	F.	2.08	− 23.520	
11.2	P.	21.18	− 24.662	
11.9	E.	13.30	− 24.880	− 0.007
12.1	E.	18.30	− 24.915	
12.3	E.	21.20	− 24.910	− 0.026
12.5	E.	2.87	− 25.057	
13.1	F.	17.78	− 25.394	0.000
13.3	F.	23.40	− 25.396	− 0.011
13.5	F.	4.05	− 25.445	
15.9	E.	13.30	− 25.863	− 0.023
16.1	E.	17.50	− 25.960	
16.2	E.	21.80	− 26.010	+ 0.008
16.4	E.	2.60	− 25.970	
16.9	F.	16.10	− 26.040	+ 0.037
1877.		s.	s.	s.
Nov. 17.1	F.	17.60	− 26.030	
17.3	F.	23.62	− 26.102	− 0.043
17.4	F.	1.45	− 26.180	
18.9	P.	14.63	− 26.313	− 0.004
19.1	P.	18.62	− 26.330	
19.3	P.	0.07	− 26.310	− 0.001
19.5	P.	3.90	− 26.312	
19.9	E.	13.77	− 26.267	− 0.038
20.1	E.	18.77	− 26.457	
20.2	E.	21.93	− 26.130	− 0.014
20.4	E.	3.80	− 26.213	
27.6	P.	7.58	− 28.368	− 0.022
27.7	P.	10.18	− 28.425	
Dec. 2.9	P.	15.42	− 30.694	− 0.005
3.1	P.	19.32	− 30.712	
3.2	P.	23.94	− 30.838	+ 0.003
3.5	P.	7.30	− 30.814	
6.3	E.	23.83	− 31.443	
7.9	F.	15.90	− 31.957	+ 0.037
8.1	F.	19.61	− 31.821	
8.3	F.	0.91	− 32.040	− 0.017
8.5	F.	4.32	− 32.098	
9.1	P.	20.78	− 32.268	+ 0.014
9.2	P.	23.10	− 32.235	
10.2	E.	22.60	− 32.326	− 0.002
10.4	E.	1.80	− 32.333	
11.2	F.	1.16	− 32.863	− 0.007
11.5	F.	6.02	− 32.898	
13.9	E.	15.10	− 33.082	− 0.026
14.1*	E.	19.42	− 31.195	
14.2	E.	23.52	− 31.148	+ 0.028
14.4	E.	3.80	− 31.027	
14.9	F.	16.25	− 31.120	− 0.003
15.1	F.	19.80	− 31.129	

* Clock lost 2^s between $15^h.5$ and $18^h.5$, probably before $17^h.5$.

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1877.		s.	s.	s.	1877.		s.	s.	s.
Dec. 15.2	F.	0.25	− 31.170	+ 0.005	Dec. 19.4	F.	4.17	− 31.527	− 0.013
15.3	F.	1.35	− 31.165		19.5	F.	6.08	− 31.552	
17.9	E.	15.45	− 31.520	+ 0.007	30.9	F.	18.50	− 32.320	− 0.001
18.1	E.	19.30	− 31.492		31.3	F.	3.53	− 32.327	
18.3	E.	2.87	− 31.457	− 0.029	31.3	E.	2.38	− 32.450	− 0.006
18.5	E.	4.80	− 31.513		31.4	E.	3.78	− 32.442	

TABLE E.—*Zenith-Point Corrections derived from Observations of the Nadir and Reflected Stars.*

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Jan. 17.0	19.5	E.	Nadir . .	+0 50.72	+0 50.72
24.9	19.7	F.	Nadir . .	56.15	+0 56.15
25.3	4.2	F.	Nadir . .	56.42	+0 56.18
25.3	5.0	F.	11 Orionis. .	55.14	
25.4	5.1	F.	ι Aurigæ. .	54.94	
25.4	6.8	F.	Nadir . .	57.30	
25.9	17.9	S.	γ Draconis .	53.32	+0 53.87
25.9	19.1	S.	Nadir . .	54.53	
26.1	23.1	S.	Nadir . .	52.94	
26.4	5.0	S.	Nadir . .	54.14	+0 53.81
26.4	5.1	S.	α Aurigæ. .	52.35	
26.4	5.3	S.	β Tauri . .	53.30	
26.5	8.9	S.	ι Urs. Maj .	52.76	
26.6	10.1	S.	Nadir . .	54.80	
26.9	19.2	P.	Nadir . .	54.72	+0 53.77
27.1	22.5	P.	Nadir . .	52.82	
27.5	8.3	P.	B.A.C. 2819	52.72	+0 53.67
27.5	8.5	P.	B.A.C. 2901	53.69	
27.5	9.2	P.	Nadir . .	53.74	
27.6	10.0	P.	α Leonis . .	54.36	
27.6	10.9	P.	α Urs. Maj .	52.01	
28.4	5.9	E.	B.A.C. 1939	55.10	+0 55.61
28.5	7.4	E.	Nadir . .	55.82	
28.5	7.8	E.	B.A.C. 2609	55.01	
28.9	19.9	F.	Nadir . .	54.41	+0 53.42
29.1	23.0	F.	Nadir . .	52.43	
29.4	5.7	F.	Nadir . .	54.56	+0 54.56
29.9	17.9	S.	γ Draconis .	53.95	+0 54.21
29.9	19.4	S.	Nadir . .	54.31	
30.1	23.0	S.	B.A.C. 8032	53.46	
30.1	23.3	S.	Nadir . .	53.86	
30.3	4.6	S.	Nadir . .	52.95	+0 53.68
30.3	4.9	S.	B.A.C. 1536	51.72	
30.3	5.9	S.	B.A.C. 1939	53.61	
30.5	9.1	S.	B.A.C. 3146	54.07	
30.5	10.1	S.	32 Urs. Maj. .	53.44	
30.5	10.6	S.	B.A.C. 3652	52.27	
30.5	11.1	S.	δ Leonis . .	53.90	
30.6	11.3	S.	Nadir . .	54.78	
30.9	17.9	E.	γ Draconis .	53.75	+0 54.33
30.9	19.8	E.	Nadir . .	54.10	
Feb. 1.3	4.8	P.	Nadir . .	+0 53.09	+0 53.09
1877.	h.			′ ″	′ ″
Feb. 3.4	6.1	S.	Nadir . .	+0 54.01	+0 53.97
3.5	7.8	S.	B.A.C. 2609	53.00	
3.5	9.1	S.	B.A.C. 3146	53.99	
5.9	20.7	F.	Nadir . .	55.48	+0 54.80
6.1	23.8	F.	Nadir . .	54.11	
6.3	5.1	F.	Nadir . .	53.37	+0 54.98
6.5	. .	F.	Nadir . .	56.41	
6.5	8.8	F.	ι Urs. Maj. .	54.36	
6.9	20.1	S.	Nadir . .	54.57	+0 54.24
7.1	23.1	S.	Nadir . .	53.91	
7.3	4.3	S.	Nadir . .	54.19	+0 55.26
7.3	4.8	S.	B.A.C. 1514	54.14	
7.5	9.1	S.	B.A.C. 3146	54.08	
7.5	10.1	S.	32 Urs. Maj. .	53.94	
7.6	10.7	S.	Nadir . .	53.98	
7.8	15.7	S.	B.A.C. 5216	56.02	
7.8	16.2	S.	Nadir . .	56.14	
7.8	16.7	S.	B.A.C. 5643	54.88	
7.8	17.4	S.	β Draconis .	55.21	
7.9	18.4	P.	Nadir . .	56.49	+0 55.41
7.9	19.6	P.	B.A.C. 6734	55.06	
7.9	20.6	P.	α Cygni . .	54.80	
7.9	21.3	P.	α Cephei . .	54.32	
8.1	23.1	P.	Nadir . .	54.69	
8.1	0.0	P.	α Andromedæ	54.57	
8.3	4.7	P.	Nadir . .	53.98	+0 55.01
8.3	5.8	P.	α Orionis. .	54.98	
8.4	6.5	P.	γ Geminorum	55.46	
8.4	6.7	P.	51 Cephei . .	54.48	
8.4	7.3	P.	B.A.C. 2439	53.98	
8.4	7.7	P.	B.A.C. 2609	54.54	
8.9	21.3	E.	Nadir . .	56.14	+0 55.32
9.1	0.8	E.	Nadir . .	54.51	
9.4	5.8	E.	α Orionis. .	55.36	+0 55.87
9.4	6.4	E.	Nadir . .	54.91	
9.4	7.3	E.	B.A.C. 2439	53.49	
9.4	7.5	E.	α Can. Min. .	56.20	
9.4	7.7	E.	B.A.C. 2609	56.90	
9.5	9.5	E.	Nadir . .	56.53	
10.2	1.1	F.	Nadir . .	52.30	+0 52.30
10.4	7.3	F.	Nadir . .	55.46	+0 54.57
10.4	8.1	F.	B.A.C. 2778	54.20	
10.5	8.3	F.	B.A.C. 2819	52.54	
10.5	9.6	F.	Nadir . .	+0 55.17	

Table E.—*Zenith-Point Corrections, etc.*—Continued.

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Feb. 13.1	0.8	E.	Nadir . .	+0 55.98	+0 55.98
13.4	6.9	E.	B. A.C. 2305	56.44	+0 56.96
13.4	7.2	E.	δ Geminorum	56.19	
13.4	7.7	E.	B. A.C. 2609	56.10	
13.4	8.0	E.	B. A.C. 2697	57.04	
13.4	8.2	E.	Nadir . .	57.22	
14.4	8.0	F.	Nadir . .	55.45	+0 55.30
14.5	9.9	F.	Nadir . .	55.14	
14.9	20.3	S.	Nadir . .	53.07	+0 52.96
15.1	23.4	S.	Nadir . .	52.84	
15.3	4.9	S.	Nadir . .	51.27	+0 52.43
15.3	5.7	S.	B.A.C.1849	49.74	
15.6	10.8	S.	B.A.C.3742^1	54.12	
15.6	11.2	S.	Nadir . .	53.67	
15.8	17.9	P.	γ Draconis .	53.31	+0 53.94
15.9	19.2	P.	δ Draconis .	52.98	
15.9	19.4	P.	B. A.C. 6690	54.35	
15.9	20.1	P.	Nadir . .	53.41	
17.4	8.5	E.	Nadir . .	55.23	+0 55.23
19.3	6.5	S.	Nadir . .	54.08	+0 54.17
19.4	7.7	S.	B. A.C. 2609	53.63	
19.4	8.4	S.	η Cancri . .	53.90	
20.3	5.1	P.	α Aurigæ .	52.15	+0 53.77
20.3	5.3	P.	β Tauri . .	53.61	
20.3	5.5	P.	B. A.C. 1767	53.61	
20.3	5.7	P.	B. A.C. 1849	52.10	
20.3	6.0	P.	Nadir . .	53.13	
20.6	11.7	P.	β Leonis . .	54.16	
20.6	11.8	P.	γ Urs. Maj. .	53.90	
20.6	12.0	P.	ο Virginis .	54.18	
20.6	12.1	P.	4 Draconis .	53.50	
20.6	12.7	P.	Nadir . .	53.75	
20.9	20.6	E.	α Cygni . .	53.20	+0 53.57
20.9	20.8	E.	Nadir . .	54.39	
21.1	1.6	E.	Nadir . .	52.20	
21.2	2.0	E.	α Arietis . .	53.57	
21.3	5.0	E.	11 Orionis .	52.13	+0 52 31
21.4	8.1	E.	Nadir . .	52.82	
21.4	8.3	E.	B. A.C. 2819	51.06	
25.4	8.0	E.	B. A.C. 2697	52.54	+0 53.52
25.4	8.2	E.	B. A.C. 2778	53.01	
25.4	8.3	E.	Nadir . .	54.10	
27.5	9.3	S.	Nadir . .	53.04	+0 53.18
27.5	10.7	S.	l Leonis . .	53.21	
27.9	21.3	P.	α Cephei . .	52.50	+0 53.24
27.9	22.5	P.	Nadir . .	+0 53.17	
1877.	h.			′ ″	′ ″
Feb. 28.4	8.9	P.	Nadir . .	+0 53.24	+0 53.59
28.5	10.8	P.	B.A.C.3742^1	53.68	
28.5	10.9	P.	α Urs. Maj. .	52.95	
28.9	21.9	E.	Nadir . .	53.70	+0 52.75
Mar. 1.1	2.0	E.	Nadir . .	51.80	
2.9	20.1	S.	Nadir . .	52.51	+0 52.51
5.9	22.4	S.	Nadir . .	53.88	+0 53.54
6.1	0.8	S.	Nadir . .	53.20	
7.5	10.9	S.	α Urs. Maj. .	51.44	+0 52.08
7.5	11.7	S.	B. A.C. 4002	51.70	
7.6	12.7	S.	Nadir . .	52.19	
9.4	10.4	E.	Nadir . .	55.85	+0 55.85
14.9	22.3	P.	Nadir . .	55.38	+0 54.48
15.1	2.3	P.	Nadir . .	53.59	
15.4	8.3	P.	B. A.C. 2819	53.92	+0 55.15
15.4	9.1	P.	B. A.C. 3146	54.65	
15.4	9.3	P.	ι Draconis .	53.63	
15.4	9.6	P.	B. A.C. 3303	54.68	
15.4	10.2	P.	Nadir . .	54.41	
15.6	14.7	P.	ε Bootis . .	55.26	
15.6	14.8	P.	B. A.C. 4905	55.97	
15.6	14.9	P.	β Urs. Min. .	54.94	
15.6	15.3	P.	γ^3 Urs. Min. .	54.90	
15.7	16.3	P.	Nadir . .	55.51	
20.1	2.8	F.	Nadir . .	51.34	+0 51.34
20.4	9.2	F.	Nadir . .	53.98	+0 53.98
23.4	8.4	S.	Nadir . .	53.52	+0 53.12
23.5	12.6	S.	B.A.C. 4268	53.04	
23.5	13.5	S.	Nadir . .	52.69	
24.5	11.7	P.	B. A.C. 3981	53.03	+0 53.70
24.5	11.8	P.	χ Urs. Maj. .	52.76	
24.5	12.2	P.	η Virginis .	54.01	
24.5	12.3	P.	B. A.C. 4195	53.65	
24.5	12.6	P.	Nadir . .	53.23	
30.1	3.5	F.	Nadir . .	50.26	+0 50.26
30.4	11.2	F.	Nadir . .	54.03	+0 54.50
30.6	14.7	F.	Nadir . .	54.97	
Apr. 3.0	2.3	F.	Nadir . .	53.99	+0 53.99
5.4	11.0	P.	Nadir . .	53.82	+0 54.21
5.5	12.1	P.	4 Draconis .	52.88	
5.5	12.5	P.	κ Draconis .	54.30	
5.9	23.4	E.	Nadir . .	+0 54.09	+0 54.09

TABLE E.—*Zenith-Point Corrections, etc.*—Continued.

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Apr. 6.3	8.8	E.	ι Urs. Maj. .	+0 54.14	+0 55.13
6.4	9.5	E.	Nadir . .	55.27	
6.4	10.0	E.	α Leonis . .	55.06	
6.8	20.5	E.	Nadir . .	55.63	+0 55.63
6.9	0.7	F.	Nadir . .	52.58	+0 52.78
7.1	4.2	F.	Nadir . .	52.98	
7.4	10.4	F.	Nadir . .	52.86	+0 53.14
7.5	12.4	F.	Nadir . .	53.42	
10.9	1.2	F.	Nadir . .	53.43	+0 52.81
11.1	4.6	F.	Nadir . .	52.19	
11.4	10.7	F.	l Leonis . .	53.58	+0 53.36
11.4	10.9	F.	α Urs. Maj. .	52.45	
11.5	12.2	F.	Nadir . .	53.47	
11.5	14.0	F.	α Draconis .	51.76	
11.5	14.3	F.	Nadir .. .	53.82	
11.9	23.2	S.	Nadir . .	53.56	+0 52.40
12.2	4.1	S.	Nadir . .	51.25	
12.3	8.8	S.	Nadir . .	53.01	+0 52.92
12.5	12.0	S.	ο Virginis .	52.64	
12.5	14.4	S.	Nadir . .	53.01	
14.3	10 3	E.	Nadir . .	54.46	+0 53.92
14.4	11.3	E.	B.A.C.3877	53.52	
14.4	11.8	E.	γ Urs. Maj. .	52.59	
14.5	12.7	E.	Nadir . .	54.19	
20.3	9.9	S.	Nadir . .	56.11	
21.3	9.9	P.	Nadir . .	55.14	
22.4	10.8	E.	B.A.C.3742[1]	54.54	+0 54.87
22.4	11.4	E.	λ Draconis .	54.10	
22.5	12.7	E.	Nadir . .	55.06	
23.1	5.1	F.	Nadir . .	53.27	+0 53.27
23.3	10.4	F.	9 Draconis .	51.48	+0 54.24
23.3	10.9	F.	α Urs. Maj. .	52.64	
23.4	11.1	F.	θ Leonis . .	54.98	
23.4	12.0	F.	Nadir . .	54.75	
23.5	14.3	F.	Nadir . .	55.61	
23.9	0.4	S.	Nadir . .	54.12	+0 53.49
24.1	4.7	S.	Nadir . .	52.86	
24.3	10.3	S	Nadir . .	+0 54.52	+0 54.52
1877.	h.			′ ″	′ ″
Apr. 25.3	10.6	P.	B.A.C.3652	+0 53.68	+0 55.16
25.3	10.7	P.	l Leonis . .	54.74	
25.4	10.9	P.	α Urs. Maj. .	54.04	
25.4	11.2	P.	B.A.C.3851	55.12	
25.4	12.0	P.	Nadir . .	54.14	
25.5	15.3	P.	γ^2 Urs. Min. .	55.58	
25.5	15.5	P.	α Cor. Bor. .	55.40	
25.6	15.6	P.	α Serpentis .	55.42	
25.6	15.8	P.	ζ Urs. Min. .	54.71	
May 1.5	14.9	F.	Nadir . .	54.14	+0 54.14
2.5	13.9	S.	B.A.C.4672	53.42	+0 53.75
2.5	15.1	S.	Nadir . .	53.96	
2.7	20.1	S.	Nadir . .	53.76	
3.8	21.1	P.	ζ Cygni . .	53.10	+0 53.44
3.8	21.3	P.	α Cephei . .	52.59	
3.8	21.7	P.	Nadir . .	53.71	
3.9	0.6	E.	α Cassiopeæ .	52.15	+0 52.44
3.9	1.4	E.	Nadir . .	54.15	
4.1	4.5	E.	α Tauri . .	52.28	
4.1	5.1	E.	α Aurigæ .	51.10	
4.1	5.6	E.	Nadir . .	50.78	
6.8	23.3	S.	Nadir . .	53.91	+0 53.91
6.9	0.8	P.	B.A.C.253	52.19	+0 52.34
6.9	1.9	P.	Nadir . .	52.39	
7.0	3.3	P.	α Persei . .	50.82	
9.9	2.1	S.	Nadir . .	52.99	+0 52.99
10.9	0.6	P.	α Cassiopeæ .	52.68	+0 53.36
10.9	0.8	P.	B.A.C.253.	52.68	
10.9	2.8	P.	Nadir . .	53.10	
12.3	11.8	E.	γ Urs. Maj. .	53.48	+0 53.87
12.4	13.6	E.	Nadir . .	54.35	
12.5	14.2	E.	α Bootis . .	52.86	
14.3	11.0	S.	Nadir . .	54.42	+0 54.42
14.4	12.2	S.	B.A.C.4123	52.87	
14.4	12.3	S.	B.A.C.4195	53.73	
14.6	16.8	S.	Nadir . .	54.76	
14.9	2.9	P.	Nadir . .	52.70	+0 52.72
14.9	3.3	P.	α Persei . .	51.78	
15.1	6.4	P.	Nadir . .	52.87	
15.4	13.7	P.	η Urs. Maj. .	54.56	+0 55.19
15.4	14.2	P.	α Bootis . .	54.50	
15.5	15.2	P.	Nadir . .	54.76	
15.6	17.2	P.	α^1 Herculis .	55.18	
15.6	17.6	P.	Nadir . .	55.54	
15.6	17.9	P.	γ Draconis .	+0 54.80	

TABLE E —*Zenith-Point Corrections, etc.*—Continued.

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
May 17.0	3.9	F.	Nadir . .	+0 56.10	+0 56.10
17.5	14.5	F.	Nadir . .	58.16	+0 57.49
17.5	15.3	F.	γ² Urs. Min. .	(?) 55.40	
17.5	15.9	F.	ε Cor. Bor. .	58.01	
17.9	2.8	S.	Nadir . .	57.15	+0 57.16
18.1	5.7	S.	Nadir . .	57.17	
18.3	11.8	S.	γ Urs. Maj. .	56.08	+0 58.21
18.3	12.0	S.	ο Virginis .	58.62	
18.4	14.1	S.	Nadir . .	58.35	
18.6	17.8	S.	Nadir . .	58.88	
21.9	2.3	S.	Nadir . .	59.34	+0 59.34
22.5	15.8	S.	Nadir . .	60.28	+1 0.28
22.9	2.8	P.	Nadir . .	55.55	+0 55.55
23.4	14.5	P.	Nadir . .	55.98	+0 56.01
23.4	14.8	P.	B.A.C.4905²	56.06	
23.5	15.6	P.	α Serpentis .	56.44	
23.5	16.8	P.	Nadir . .	55 37	
24.4	13.7	E.	η Urs. Maj. .	54.48	+0 55.11
24.5	15.5	E.	α Cor. Bor. .	54.48	
24.5	16.5	E.	Nadir . .	55.47	
25.9	3.1	S.	Nadir . .	51.97	+0 51.97
27.9	3.5	E.	Nadir . .	50.63	+0 50.63
28.1	6.8	E.	Nadir . .	50.63	
28.4	13.7	E.	η Urs. Maj. .	51.00	+0 52.03
28.5	16.2	E.	B. A.C. 5437	51.27	
28.5	17.0	E.	Nadir . .	52.90	
31.5	16.6	P.	Nadir . .	49.01	+0 50.27
31.6	17.9	P.	γ Draconis .	50.14	
31.6	19.0	P.	ζ Aquilæ . .	50.67	
31.6	19.2	P.	Nadir . .	50.35	
31.9	2.5	E.	Nadir . .	49.69	+0 48.91
June 1.1	7.7	E.	Nadir . .	48.13	
1.4	13.6	E.	B. A.C. 4568	49.66	+0 50.45
1.4	15.0	E.	Nadir . .	50.52	
1.5	15.6	E.	α Serpentis .	50.36	
7.9	4.3	P.	Nadir . .	50.49	+0 50.49
11.4	16.0	S.	B. A.C. 5348	51.24	+0 52.15
11.5	16.7	S.	Nadir . .	52.25	
12.9	4.3	E.	Nadir . .	50.27	+0 50.27
14.5	16.9	F.	κ Ophiuchi .	51.48	+0 52.15
14.5	18.0	F.	Nadir . .	53.18	
14.6	19.2	F.	δ Draconis .	+0 50 87	
1877.	h.			′ ″	′ ″
June 18.9	4.6	S.	Nadir . .	+0 53.78	+0 53.94
19.1	7.9	S.	Nadir . .	54.11	
19.4	14.4	S.	Nadir . .	54.08	+0 54.08
19.4	16.0	S.	B. A.C. 5348	61.36	+1 2.21
19.4	16.3	S.	B. A.C. 5466	61.66	
19.5	18.4	S.	Nadir . .	62.70	
19.9	5.1	P.	Nadir . .	62.83	+1 2.42
20.1	7.8	P.	Nadir . .	62.01	
20.4	15.4	P.	Nadir . .	62.77	+1 2.77
22.5	18.5	F.	Nadir . .	61.42	+1 0.40
22.5	19.0	F.	ζ Aquilæ . .	59.69	
22.5	19.2	F.	δ Draconis .	59.18	
22.9	3.3	S.	α Persei . .	61.58	+1 1.17
22.9	5.0	S.	Nadir . .	60.99	
23.1	8.2	S.	Nadir . .	60.14	
23.3	13.7	S.	η Urs. Maj. .	59.78	+1 0.72
23.3	14.0	S.	Nadir . .	60.45	
23.3	14.4	S.	ρ Bootis . .	60.26	
23.5	19.0	S.	Nadir . .	61.47	
25.5	18.0	P.	Nadir . .	60.28	+1 0.28
25.9	6.2	F.	Nadir . .	59.79	+0 59.79
28.5	18.7	P.	Nadir . .	60.62	+1 0.62
29.5	19.7	F.	Nadir . .	60.24	+1 0.12
29.6	20.2	F.	κ Cephei . .	59.40	
29.6	20.5	F.	ε Delphini .	59.80	
July 1.8	0.8	S.	Nadir . .	62.20	+1 2.20
6.5	18.4	P.	Nadir . .	59.66	+0 59.92
6.6	20.3	P.	B. A.C. 7029	59.66	
6.6	21.3	P.	α Cephei . .	59.54	
6.9	5.6	E.	Nadir . .	60.02	+0 59.50
7.1	9.5	E.	Nadir . .	58.98	
7.3	15.5	E.	α Cor. Bor. .	59.58	+0 59.58
7.4	15.8	E.	ζ Urs. Min. .	58.62	
7.4	17.4	E.	Nadir . .	59.80	
7.5	19.3	E.	τ Draconis .	58.12	
7.5	19.4	E.	B. A.C. 6690	59.95	
8.5	19.5	F.	Nadir . .	59.93	+0 59.93
11.9	7.2	F.	Nadir . .	59.15	+0 59.15
12.5	19.7	F.	γ Aquilæ . .	58.77	+0 59.05
12.6	20.6	F.	α Cygni . .	58.36	
12.6	20.8	F.	Nadir . .	+0 59.10	

TABLE E.—*Zenith-Point Corrections, etc.*—Continued.

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
July 13.1	10.3	S.	Nadir . .	+0 59.55	+0 59.55
14.6	21.0	P.	Nadir . .	58.21	+0 58.21
15.2	12.9	E.	Nadir . .	57.96	+0 57.96
16.3	15.3	F.	Nadir . .	58.45	+0 58.85
16.4	18.4	F.	Nadir . .	59.25	
26.5	20.5	P.	ε Delphini .	60.72	+1 0.54
26.5	20.7	P.	B.A.C.7220	60.28	
26.5	20.9	P.	Nadir . .	59.98	
26.5	21.1	P.	ζ Cygni . .	60.04	
26.5	21.3	P.	α Cephei . .	59.85	
27.9	8.0	F.	Nadir . .	59.62	+1 0.69
29.6	21.7	S.	Nadir . .	60.50	
29.7	0.3	S.	B.A.C.79 .	59.83	
29.7	1.9	S.	Nadir . .	60.93	
29.9	8.2	P.	Nadir . .	63.16	+1 3.25
30.1	9.9	P.	Nadir . .	62.94	
30.1	10.9	P.	α Urs. Maj. .	62.84	
30.5	20.5	P.	ε Delphini .	62.50	+1 2.31
30.5	20.7	P.	B.A.C.7220	61.84	
30.5	20.9	P.	Nadir . .	62.13	
30.7	0.4	P.	12 Ceti. . .	61.93	
30.7	0.6	P.	α Cassiopeæ .	61.82	
30.7	1.5	P.	Nadir . .	61.84	
Aug. 3.8	4.1	P.	Nadir . .	61.06	+1 1.06
6.6	22.2	S.	Nadir . .	61.83	+1 2.36
6.7	0.2	S.	Nadir . .	62.90	
9.5	20.2	F.	Nadir . .	62.60	+1 2.60
9.9	7.2	S.	Nadir . .	63.35	+1 3.35
11.5	20.8	E.	Nadir . .	61.22	+1 1.22
15.9	8.3	E.	Nadir . .	61.52	+1 1.52
17.4	19.3	S.	Nadir . .	60.79	+1 0.79
18.5	22.0	F.	Nadir . .	60.04	+1 0.24
18.6	0.4	F.	Nadir . .	60.44	
20.4	19.0	S.	Nadir . .	60.10	+1 0.10
21.5	21.0	E.	Nadir . .	60.15	+1 0.15
27.5	21.9	S.	Nadir . .	60.88	+1 0.76
27.6	0.3	S.	Nadir . .	60.65	
28.4	20.0	E.	B.A.C.6905	59.71	+1 0.21
28.4	21.3	E.	Nadir . .	60.01	
28.4	21.5	E.	ξ Aquarii. .	60.58	
30.4	20.9	E.	Nadir . .	+0 59.94	+0 59.94

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Sept. 1.5	22.4	F.	Nadir . .	+0 60.78	+1 0.74
1.5	23.9	F.	Nadir . .	60.70	
3.5	21.8	F.	Nadir . .	60.12	+1 0.54
3.5	0.2	F.	Nadir . .	60.95	
10.0	12.6	F.	Nadir . .	54.44	+0 54.44
15.4	22.2	F.	Nadir . .	61.24	+1 1.24
18.4	21.6	F.	Nadir . .	60.44	+1 0.44
21.5	23.7	F.	Nadir . .	58.81	+0 58.98
21.5	0.4	F.	Nadir . .	59.15	
22.4	20.8	F.	Nadir . .	58.29	+0 58.37
22.5	23.7	F.	Nadir . .	58.45	
24.4	23.5	F.	Nadir . .	57.78	+0 57.78
26.4	21.4	P.	Nadir . .	58.57	+0 58.62
26.4	21.8	P.	B.A.C.7643	58.01	
26.4	22.2	P.	θ Aquarii .	58.95	
27.4	20.9	F.	Nadir . .	59.38	+0 59.38
Oct. 1.4	21.6	F.	Nadir . .	58.88	+0 58.88
1.4	23.5	F.	Nadir . .	58.89	
2.4	21.3	P.	ι Pegasi . .	59.47	+0 58.98
2.4	21.5	P.	β Cephei . .	58.38	
2.4	21.7	P.	Nadir . .	58.58	
2.5	23.7	P.	B. A. C.8268	58.44	
2.5	0.0	P.	α Andromedæ	59.14	
2.5	0.5	P.	Nadir . .	58.99	
4.9	12.2	S.	Nadir . .	59.39	+0 58.80
5.1	15.5	S.	Nadir . .	58.00	
5.4	21.2	F.	Nadir . .	58.42	+0 58.42
6.4	22.1	F.	Nadir . .	57.04	+0 57.48
6.5	0.5	F.	Nadir . .	57.9_3	
9.4	23.3	P.	Nadir . .	57.60	+0 57.60
11.4	22.7	E.	Nadir . .	56.82	+0 56.82
12.3	21.4	F.	Nadir . .	58.23	+0 58.24
12.3	23.9	F.	Nadir . .	58.26	
12.9	11.4	S.	Nadir . .	58.30	+0 57.16
13.1	16.0	S.	Nadir . .	56.03	
13.3	20.1	S.	Nadir . .	57.62	+0 59.96
13.3	20.7	S.	B. A. C.7220	59.72	
13.5	1.7	S.	Nadir . .	61.91	
14.3	21.8	P.	B. A. C.7643	61.34	+1 1.44
14.3	22.1	P.	Nadir . .	61.42	
14.4	22.2	P.	θ Aquarii. .	61.76	
14.4	23.6	P.	γ Cephei . .	60.50	
14.4	0.0	P.	α Andromedæ	61.89	
14.4	0.2	P.	Nadir . .	+0 61.06	

TABLE E.—*Zenith-Point Corrections, etc.*—Continued.

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Oct. 15.4	23.6	E.	Nadir . .	+0 60.83	+1 0.72
15.4	0.4	E.	B. A. C. 126	59.97	
15.4	0.5	E.	B. A. C. 166	61.02	
16.4	22.1	F.	Nadir . .	60.07	+1 0.07
17.3	20.9	S.	Nadir . .	60.97	+1 1.01
17.4	23.5	S.	Nadir . .	61.12	
17.4	23.6	S.	Nadir . .	60.94	
18.5	2.6	P.	γ Ceti . . .	62.12	+1 1.54
18.5	3.0	P.	B. A. C. 962	61.01	
18.6	3.2	P.	Nadir . .	61.16	
22.4	0.8	F.	Nadir . .	62.35	+1 2.01
22.5	1.6	F.	ο Piscium .	62.64	
22.5	2.0	F.	α Arietis . .	61.61	
22.9	13.6	E.	Nadir . .	61.81	+1 1.81
23.3	22.6	E.	B. A. C. 7923	61.24	+1 1.22
23.4	0.6	E.	Nadir . .	60.94	
23.5	2.7	E.	B. A. C. 863	61.13	
24.4	0.1	P.	γ Pegasi . .	48.52	+0 49.05
24.4	0.5	P.	α Cassiopeæ .	47.89	
24.4	0.8	P.	Nadir . .	49.09	
24.5	3.1	P.	Nadir . .	49.25	
24.5	3.2	P.	α Persei . .	49.20	
24.6	3.7	P.	η Tauri . .	49.69	
31.4	0.5	E.	Nadir . .	50.05	+0 50.40
31.5	1.8	E.	B. A. C. 569	52.04	
31.5	2.3	E.	ι Cassiopeæ .	48.78	
31.9	14.3	P.	Nadir . .	49.82	+0 49.33
Nov. 1.0	15.6	P.	Nadir . .	48.84	
2.4	23.7	S.	Nadir . .	50.29	+0 50.51
2.5	2.7	S.	B. A. C. 863	50.28	
2.5	3.7	S.	η Tauri . .	49.80	
2.6	4.8	S.	Nadir . .	51.33	
3.0	16.6	F.	Nadir . .	48.49	+0 48.49
3.5	1.8	F.	β Arietis . .	50.73	+0 49.55
3.5	2.2	F.	Nadir . .	50.37	
3.5	3.2	F.	α Persei . .	47.22	
7.0	16.8	F.	Nadir . .	47.82	+0 47.82
7.3	22.7	F.	Nadir . .	48.96	+0 49.59
7.5	3.1	F.	Nadir . .	50.22	
11.3	23.1	P.	Nadir . .	+0 52.56	+0 52.56

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Nov. 11.9	13.7	E.	η Urs. Maj. .	+0 52.18	+0 52.01
11.9	14.2	E.	α Bootis . .	52.01	
11.9	14.3	E.	Nadir . .	52.53	
12.1	17.9	E.	γ Draconis .	50.58	
12.1	18.6	E.	Nadir . .	51.79	
12.3	23.5	E.	ι Piscium .	51.54	+0 51.56
12.4	0.0	E.	Nadir . .	52.34	
12.4	0.8	E.	B. A. C. 253	50.45	
12.9	14.2	F.	α Bootis . .	52.12	+0 50.90
13.1	17.0	F.	Nadir . .	50.55	
13.1	17.9	F.	γ Draconis .	49.70	
13.4	2.0	F.	Nadir . .	51.72	+0 51.82
13.4	3.6	F.	δ Persei . .	51.29	
15.9	13.7	E.	η Urs. Maj. .	52.59	+0 52.83
15.9	14.2	E.	α Bootis . .	53.18	
15.9	14.5	E.	Nadir . .	52.38	
16.3	23.2	E.	ο Cephei . .	52.74	+0 52.91
16.3	23.6	E.	ι Piscium .	53.76	
16.4	1.4	E.	Nadir . .	51.88	
17.1	18.0	F.	Nadir . .	50.21	+0 50.21
17.4	1.8	F.	Nadir . .	54.44	+0 54.44
18.9	14.6	P.	Nadir . .	54.53	+0 54.34
18.9	15.6	P.	Nadir . .	54.47	
19.1	18.0	P.	Nadir . .	54.01	
19.4	1.4	P.	η Piscium .	53.58	+0 53.43
19.4	1.6	P.	Nadir . .	53.38	
19.4	1.9	P.	50 Cassiopeæ .	52.99	
19.9	13.7	E.	η Urs. Maj. .	52.64	+0 53.06
19.9	14.5	E.	Nadir . .	53.25	
20.1	18.8	E.	Nadir . .	52.67	
20.3	23.7	E.	B. A. C. 8268	52.18	+0 53.23
20.4	0.8	E.	Nadir . .	53.53	
20.4	1.4	E.	η Piscium .	53.64	
27.7	9.6	P.	ε Leonis . .	57.90	+0 58.19
27.7	10.4	P.	9 Draconis .	58.14	
Dec. 2.9	16.4	P.	Nadir . .	54.56	+0 53.78
3.0	17.9	P.	γ Draconis .	53.60	
3.1	19.7	P.	α Aquilæ . .	53.52	
3.1	20.0	P.	Nadir . .	+0 53.09	

TABLE E.—*Zenith-Point Corrections, etc.*—Continued.

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Dec. 3.4	1.9	P.	50 Cassiopeæ.	+0 54.33	+0 55.00
3.4	2.1	P.	ξ¹ Ceti. . .	55.04	
3.4	2.5	P.	Nadir . .	54.85	
3.6	6.4	P.	23 (H.) Camel.	54.54	
3.6	6.6	P.	B.A.C.2194	55.67	
3.6	7.0	P.	Nadir . .	54.86	
6.3	0.8	E.	Nadir . .	56.40	+0 56.40
8.1	20.7	F.	Nadir . .	55.38	+0 55.38
8.4	1.7	F.	Nadir . .	56.37	+0 56.37
9.2	22.2	P.	Nadir . .	55.75	+0 56.14
9.2	22.5	P.	226 Cephei. .	55.74	
9.2	22.8	P.	λ Aquarii .	56.58	
10.3	23.7	E.	B.A.C.8268	53.72	+0 54.88
10.3	0.1	E.	γ Pegasi . .	55.01	
10.3	0.5	E.	Nadir . .	55.57	
11.4	2.9	F.	Nadir . .	55.63	+0 55.46
11.4	3.0	F.	B. A. C. 962	53.86	
11.4	3.1	F.	ζ Arietis . .	55.95	
11.6	7.1	F.	Nadir . .	+0 56.06	

Mean Day.	Sidereal Hour.	Observer.	Object.	Observed Zenith-Point Correction.	Adopted Zenith-Point Correction.
1877.	h.			′ ″	′ ″
Dec. 13.9	14.8	E.	β Urs. Min. .	+0 55.14	+0 55.67
13.9	16.0	E.	Nadir . .	55.92	
14.1	19.8	E.	Nadir . .	55.32	
14.3	0.3	E.	B. A. C. 79.	55.43	+0 55.40
14.3	1.6	E.	Nadir . .	54.58	
14.4	4.2	E.	γ Tauri . .	55.86	
15.1	19.6	F.	Nadir . .	52.61	+0 52.61
15.4	2.5	F.	Nadir . .	55.00	+0 55.00
17.9	16.4	E.	β Herculis .	56.42	+0 55.80
17.9	16.8	E.	Nadir . .	55.87	
18.1	20.6	E.	α Cygni . .	54.80	
18.1	20.8	E.	Nadir . .	55.75	
18.4	3.6	E.	δ Persei . .	56.18	+0 56.42
18.4	3.7	E.	η Tauri . .	55.78	
18.4	4.1	E.	Nadir . .	56.96	
19.5	6.6	F.	Nadir . .	+0 56.01	+0 56.01

THE MERIDIAN TRANSIT INSTRUMENT.

During the year 1877 this instrument was used for observing stars whose position in declination had been previously determined by the Mural Circle or the Prime Vertical Transit Instrument. The method of observation was that used in previous years.

The transit system consists of five groups or tallies of vertical threads; and in addition to these there are three vertical threads, movable by a micrometer screw and two stationary horizontal ones. With the clamp end of the axis to the east, the tallies are named, in the order of the transit of stars above the pole, A, B, C, D, and E.

The tally over which an object has been observed is shown by the inspection of the intervals between the threads. The individual threads of each tally are designated by the numbers 1, 2, 3, 4, 5, for A, C, and E, and 1, 2, and 3, for B and D, respectively. One vertical thread, A_0, is outside of tally A and another, E_6, is outside of E. These two, with A_5, B_3, C_3, D_1, and E_1, constitute a system over which transits with eye and ear may be conveniently observed.

On the 12th of January, 1871, Mr. GARDNER inserted a new set of threads on a plate scored by Mr. WILLIAM WÜRDEMAN.

From a number of observations of Polaris, above and below the pole, the equatorial intervals between each thread, and the mean of B_1, B_2, B_3, C_1, C_2, C_3, C_4, C_5, D_1, D_2, D_3, were found to be as follows, the notation corresponding to clamp east:

Thread.	Interval.	Thread.	Interval.	Thread.	Interval.	Thread.	Interval.	Thread.	Interval.
	s.		s.		s.		s.		s.
A_1	+37.687	.	. .	C_1	+ 3.200	D_1	−15.046	E_1	−30.198
A_2	+35.806	.	. .	C_2	+ 1.665	D_2	−17.571	E_2	−32.702
A_3	+34.151	B_1	+19.064	C_3	+ 0.003	D_3	−19.213	E_3	−34.266
A_4	+32.634	B_2	+17.584	C_4	− 1.651	.	. .	E_4	−35.945
A_5	+29.988	B_3	+15.134	C_5	− 3.167	.	. .	E_5	−37.880

The times of transits of all objects more than 5° distant from the pole were recorded by the Howard and Davis chronograph.

INSTRUMENTAL ERRORS.

Aided by a collimating eye-piece, the error of level and collimation were obtained by reversing the instrument over a basin of mercury, and measuring with the micrometer screw of the eye-piece the distance between the central thread and its image seen in the mercury. If we represent by 2Δ, the distance of the central thread west of its image when the clamp end of the axis is east; by $2\Delta^1$, the same quantity when the clamp is west; by p, the excess of the radius of the clamp-pivot divided by the distance between the pivots; and by $-r$ the reduction of the central thread to the mean of the system B_1, B_2, B_3, C_1, C_2, C_3, C_4, C_5, D_1, D_2, D_3, and by a the correction for diurnal aberration $= -0^r.016$ in this latitude, we have—

$$c = \tfrac{1}{2}(\Delta - \Delta^1) - p + r + a \text{ for clamp east.}$$
$$c = -\tfrac{1}{2}(\Delta - \Delta^1) + p - r + a \text{ for clamp west.}$$
$$b = -\tfrac{1}{2}(\Delta + \Delta^1) - p \text{ for clamp east.}$$
$$b = -\tfrac{1}{2}(\Delta + \Delta^1) + p \text{ for clamp west.}$$

The value of p, as determined in 1864, was $p = +0^s.008$. The numerical value of r for the current year is $r = +0^s.003$. All the observations for determining the errors of collimation and their results are given in the subjoined table, in which r, the value of a resolution of the micrometer, is $1''.5865$. When great changes occur in the value of c between consecutive dates, they have been caused by adjustment with the collimating screw.

Date.		2Δ	2Δ′	C. E.	C. W.	Date.		2Δ	2Δ′	C. E.	C. W.
1877.		r.	r.	r.	r.	1877.		r.	r.	r.	r.
Jan.	3	+ 0.80	+ 0.63	+ 0.041	− 0.073	July	4	− 0.56	− 0.27	− 0.143	+ 0.111
	26	+ 0.16	+ 0.10	− 0.003	− 0.029		11	− 0.64	− 0.10	− 0.243	+ 0.211
	27	+ 0.44	− 0.13	+ 0.201	− 0.223		27	− 0.78	− 0.22	− 0.251	+ 0.219
Feb.	9	+ 0.04	+ 1.57	− 0.639	+ 0.607	Aug.	18	− 0.54	− 0.13	− 0.191	+ 0.159
	10	+ 0.15	+ 0.84	− 0.303	+ 0.271		30	− 0.55	− 0.16	− 0.183	+ 0.151
	13	− 1.70	+ 0.40	− 0.867	+ 0.835	Sept.	20	− 0.50	− 0.10	− 0.187	+ 0.150
	13	− 0.45	− 0.23	− 0.115	+ 0.083	Oct.	12	− 0.30	0.00	− 0.147	+ 0.115
Mar.	15	− 0.24	0.00	− 0.123	+ 0.091		26	− 0.23	− 0.10	− 0.079	+ 0.047
	31	− 0.45	− 0.21	− 0.123	+ 0.091	Nov.	20	0.00	+ 0.21	− 0.111	+ 0.079
May	19	− 0.87	− 0.55	− 0.155	+ 0.123	Dec.	15	0.00	+ 0.41	− 0.191	+ 0.159
June	23	− 0.85	− 0.85	− 0.027	− 0.005						

The corrections were very irregular for several days, about the first to the middle of February.

When observations to determine the value of c are tolerably accordant on successive dates, a mean is adopted for the whole period of such accordance; and where the differences are too great to permit inference that they may be due to errors of observation, the changes are assumed to have been uniformly progressive.

The values used in the reductions are stated at the bottom of each page of the printed observations.

The distance which the line of collimation passes from the pole and the point in which the meridian intercepts the equator are used instead of errors of level and azimuth.

When the error of collimation is known, the first distance is directly obtained by observation of stars very near the pole, and may be represented by n. The second distance is determined by combining the value of n with the error of the level. Designating the latter by b, the latitude of the Observatory by φ, and representing this second distance by m, we obviously have—

$$m = -n \tan \varphi + b \sec \varphi,$$

and the correction applicable to the observed transit of any star, to reduce it to the meridian, will be obtained by the formula—

$$\text{Correction} = m + n \tan \delta + c \sec \delta,$$

in which δ represents the apparent declination of the star.

An appropriate clock-error having been first obtained from one or more equatorial stars, the value of n was obtained generally by comparing the time of transit of Polaris, δ Ursæ Minoris, λ Ursæ Minoris, or 51 Cephei, with the right ascension given in the American Ephemeris and Nautical Almanac for the year 1877.

The value of n, found in this manner, and used in the reduction of the stars, may be found in the table at the bottom of the pages of the published observations, under the head of "Corrections, etc."

It will be readily seen that if m is neither large nor subject to great variation, it will be eliminated through the clock-error. It has not been used separately from the clock-error except when the instrument was used for regulating the mean time of the Observatory, and is therefore not always published in its usual place.

The clock-error was obtained from the corrected transits of one or more of the standard stars whose mean place for 1877 is given in the American Ephemeris.

The apparent places of these stars for the date was taken from the Ephemeris for 1877.

The clock used in observing was that of CHARLES FRODSHAM.

EXPLANATION OF THE PRINTED OBSERVATIONS.

Column 1 contains the date and initial letter of the observer's name, the day commencing at apparent noon.

Column 2 contains the name of the object, or its approximate declination.

The following system of nomenclature was adopted. Stars contained in the catalogue of the British Association are designated in the order of precedence:

1. By the constellation and Bayer letter there given.
2. By the constellation and Flamsteed number there given.
3. By their number in the catalogue.

Other stars found in published catalogues are designated by the name and number in the catalogue.

Column 3 contains the number for reference.

The following abbreviations occur:

O. Arg. N. for Oeltzen's Catalogue from Argelander's Northern Zones.

O. Arg. S. for Oeltzen's Catalogue from Argelander's Southern Zones.

Weisse (2) for Weisse's Catalogue from Bessel's Zones, from 15 to 45 degrees of north declination.

Some anonymous stars, used in the comparisons of the Equatorial, are denominated by a number, followed by the letter W. or the word "Washington."

Columns 4 to 14, inclusive, contain the seconds and tenths of the transits over the several threads, as noted by the observer at the time, or as subsequently read from the chronographic record; but as there are twenty-one threads, over each of which observations were taken at different times, the numbers over the columns may not represent the thread at which a star was observed; and this can only become known by comparing the observation with the equatorial intervals.

Column 15 contains the minutes, seconds, and decimals of a second obtained by taking the mean of the preceding times of transits over the threads observed.

Column 16 contains the sum of the corrections necessary to reduce the numbers of the preceding column to the clock-time at which the object crossed the great circle passing through the pole, and the point in which the line of collimation intersects the equator.

It consists of two parts:

1. For broken observations of stars, from the mean of the threads B_1, B_2, B_3, C_1, C_2, C_3, C_4, C_5, D_1, D_2, and D_3, by the formula—

$$R = \text{equatorial interval} \times \sec \delta;$$

or if the star was so near the pole that the difference between the sin and arc of the reduction was sensible,

$$\sin R = \sin \text{equatorial interval} \times \sec \delta.$$

2. The correction for collimation and polar azimuth computed by the formula—

$$\text{Correction} = n \tan \delta + c \sec \delta,$$

of which the method of obtaining the factors n and c has already been stated.

Column 17 contains the correction for clock-errors, obtained as stated, and brought forward to the instant of observation by the rate.

Column 18 contains the apparent right ascension of the object observed, obtained from the sum of the three columns immediately preceding.

Column 19 contains the corrections applicable to the preceding column to reduce the observations of the stars to their mean places 1877.0, or the instant when the sun's mean longitude was 280°.

These were computed from "Constants for the reduction of fixed stars," given in the American Ephemeris and Nautical Almanac.

The corrections include no proper motions except those used in the list of time and azimuth stars.

There will be found at the foot of the page the adopted clock and instrumental corrections, observations of the reflected image of the middle thread, position of the clamp E. or W., and such notes as the observations called for.

The several observations of each fixed star reduced to its mean place for 1877.0 are collected in pages 285 to 307.

As a general rule, the results for the fundamental stars are not given when there were less than four observations in the group used for determining clock-errors. The magnitude of each star, when estimated by the observer at the time of observation, is given in the tables.

The observations of the year with this instrument were made by Prof. M. YARNALL, U. S. N., the reductions by Professor YARNALL and Lieut. E. W. STURDY, U. S. N., and the list of mean places found on pages 285 to 307 by Lieutenant STURDY.

THE MURAL CIRCLE.

During the year 1877 the Mural Circle was employed in observing stars whose right ascensions had been previously determined by the Transit Instrument, and a number of stars above and below the pole from the British Association Catalogue.

MICROMETER AND TRANSIT THREADS.

The diaphragm inserted in February, 1871, was in use during the year. The intervals of the threads were as follows:

Threads.	I.	II.	III.	IV.	1.	2.	V.	4.	5.	VI.	VII.	VIII.	IX.
	″	″	″	″	″	″	″	″	″	″	″	″	″
Intervals.	+ 53.3	+ 40.9	+ 29.0	+ 16.0	+3.2	+1.6	0.0	−1.7	−3.3	− 16.1	− 28.5	− 40.5	− 52.7

The values of the micrometer screw were determined from the following observations; the readings being for intervals of five minutes of arc:

1875.	r.	r.	r.
May 3,	21.096	30.686	40.241
May 3,	21.098	30.673	40.234

which gives the value of the revolution $31^{r}.346$; but the value $r = 31^{r}.341$ has been used for the year.

NADIR-POINT.

For determinations of the nadir-point, a cap is provided which fits loosely over any of the eye-pieces of the telescope. Just above the eye-lens the cap has a plate of thin glass, inclined at an angle of 45°. This arrangement has the advantage of enabling the observer to collimate without removing the eye-piece used in observations, and thereby avoids the risk of injury to the threads, and prevents the frequent admission of dust by air currents, etc.

The mode of observation is as follows: The circle-telescope is so pointed that when the nadir divisions of the former are accurately under the zeros of the microscopes, the images of the horizontal threads in the field of the latter may be seen at a small distance from the threads themselves. The micrometer reading for the true nadir being that which corresponds to the coincidence of each thread, seen directly, with the image of the other seen by reflection, the images were alternately made to measure, on each side of the threads, spaces equal to their distance apart.

As the nadir thus determined always depends upon the same set of divisions of the circle, and is made with the same part of the micrometer screw, it is uniformly affected with the errors of those divisions and by any inaccuracy peculiar to that portion of the screw.

METHOD OF OBSERVING.

The method of observing was the same as in previous years, and consisted essentially in transferring the subdivisions of the circle from the microscopes to the micrometer eye-piece

The circle was set so that the divisions nearest to the reading for the given declination were as accurately as possible under the zero of the microscopes. The circle microscopes were read either before or after the observation.

The observations were made by bisecting the objects with the southern horizontal thread, and the observations of the nadir-point were reduced to the southern or northern wire from the observations of the night.

EXPLANATION OF THE PRINTED OBSERVATIONS.

Columns 1 to 3 and 7 to 12 need no explanation beyond that given in former years. The magnitudes in column 4 are those estimated by the observer at the time of observation.

Columns 5 and 6 show the number of micrometer readings, generally three for each star, and the transit thread over which the readings were made. When the number of micrometer readings does not correspond to the number of threads included between the limits given in column 6, it is understood that the observations were made at equal intervals between those limits.

Column 13 contains the mean of the six microscope readings.

Column 14 contains the mean of the observed micrometer readings.

Column 15 contains the adopted "nadir correction" expressed in micrometer revolutions.

It is formed by subtracting the excess of the micrometer reading above 30 revolutions from the excess of the mean circle reading above 200°, the reading of microscope A when the telescope pointed to the nadir; that excess being first expressed in micrometer revolutions.

Column 16 gives the corrected meridian micrometer reading formed by applying the following corrections to column 14:

1. The nadir correction.

2. The reduction to the meridian. For observations made on any of the vertical wires the reduction is given by the formula—

$$\Delta m = -\frac{\sin^2 \frac{1}{2} h}{2 r \sin 1''} \tan \delta,$$

h being the equatorial interval in arc of the vertical wire, and r the value of one revolution of the micrometer. Expressing h in seconds of time, and putting for r its value already given, this expression becomes

$$\Delta m = - \{5.2405\} h^2 \tan \delta,$$

the value of which, for different wires, is tabulated on pages XXXII and XXXIII of the introduction to the Washington Observations for 1863.

For stars near the pole, the time having been recorded, this expression becomes

$$\varDelta m = -\frac{225 \sin 1''}{4r}(t-a)^2 \sin 2\,\delta,$$

t being the true sidereal time of observation, and a the right ascension of the star.

3. The correction of unsymmetrical observations for inclination of micrometer threads to the horizon. This was $i = 0.000$ for the year.

Columns 18, 19, and 20 contain the reading of the Newman barometer, its attached thermometer, and the external thermometer. The external thermometer is designated No. 3 in the Appendix to the Washington Observations for 1845, page 54. It is placed outside of the north aperture, several inches beyond the wall, and is read by the help of a sextant telescope attached to the window-frame.

Column 21, entitled "Instrumental Corrections," contains the micrometer equivalent, or the difference between the corrected micrometer reading and 30 revolutions converted into arc.

If the former quantity is denoted by m, the value of this column will be given by the formula—

$$\text{Corr.} = (30 \text{ rev.} - m)\, r.$$

Column 22 contains the apparent zenith-distance equal to the sum of columns 13 and 21, diminished by 20°, if the sum be greater than 20°, or subtracted from 20°, if less. In the former case, the result is marked S. as South; in the latter N. as North.

Column 23 contains the correction for refraction corresponding to the apparent zenith-distance and the barometer and thermometer readings. This quantity is computed from Bessel's tables, as given in an expanded form in the Appendix to the Washington Observations for 1845.

This correction, added to the apparent zenith-distance, gives the corrected geocentric zenith-distance, which is not printed.

The following correction is applied to the thermometer readings for irregularity in the bore of the tube.

Correction of Thermometer.

Therm. scale.	Correction.	△ log ref.	Therm. scale.	Correction.	△ log ref.	Therm. scale.	Correction.	△ log ref.
°	°		°	°		°	°	
30	− 0.04	+ 0.00004	54	− 0.01	+ 0.00001	78	− 0.04	+ 0.00003
32	− .06	+ 5	56	− .01	+ 1	80	− .04	+ 3
34	− .11	+ 10	58	− .03	+ 3	82	− .01	+ 1
36	− .08	+ 7	60	.00	0	84	.00	0
38	− .05	+ 4	62	+ .05	− 4	86	− .06	+ 5
40	− .02	+ 2	64	+ .12	− 10	88	− .12	+ 10
42	− .01	+ 1	66	+ .20	− 16	90	− .14	+ 11
44	.00	0	68	+ .25	− 21	92	− .14	+ 11
46	− .01	+ 1	70	+ .22	− 18	94	− .14	+ 11
48	− .03	+ 3	72	+ .12	− 10	96	− .13	+ 11
50	− .04	+ 3	74	+ .03	− 3	98	− .12	+ 10
52	− 0.03	+ 0.00003	76	− 0.01	+ 0.00001	100	− 0.12	+ 0.00010

Column 24 contains the declination of the star, using the assumed North latit $+38^\circ 53' 38''.8$.

Column 25 contains the reduction from the apparent declination at date to mean declination for 1877.0.

It was computed by Bessel's formulæ, with the constants of the American Eph eris and Nautical Almanac; and, in addition to the terms included in that worl includes those depending on twice the moon's longitude.

Corrections for proper motions have *not* been applied to any star.

The resulting mean places of the stars are collected in pages 311 to 319, in sive.

Column 26 contains the initial of the observer's name: Y.—Prof. M. YARNALL

The observations were reduced by Prof. M. YARNALL and Lieut. E. W. STUB U. S. Navy.

THE XXVI-INCH EQUATORIAL.

The observations made with this instrument during the year 1877 will be found on pages 185–226, and the results of these observations on pages 226–231. The observers were Professors Hall and Holden, whose observations are distinguished by the symbols H. and Hn.

No change was made in this instrument during this year. Generally the achromatic eye-pieces 2 A, 3 A. 5 A, and 6 A were used, which give magnifying powers of 175, 383, 606, and 888. The observations were made in the usual manner, and in the reductions the value of a single revolution of the screw of the micrometer was assumed to be—

$$R = 9''.948.$$

The form in which the observations are printed is nearly the same as in preceding years. In the columns headed "Washington Time," two kinds of time are given. In the observations of satellites this time is the mean time of the observation, but for double stars the sidereal time of the observation of the angle of position is given to the nearest tenth of an hour.

A change has been made in printing the regular observations of satellites and double stars. Thus, instead of printing the detailed observations of such objects, the mean result of the readings is given. Generally, in the case of satellites, four settings are made for the angle of position, and two measurements of the double distance or four of the single distance are taken. For double stars four settings are made for the angle of position and two measurements of the double distance.

One exception has been made to this change in the printing. This is in the case of newly-discovered objects, for which the observations and notes are given in detail, as will be seen in the case of the companions of Procyon and the satellites of Mars. The reason for this exception is obvious, since by the omission of details an injustice might be done.

The discovery of the satellites of Mars by Professor Hall in August of this year set many astronomers at work to make similar discoveries, and several such were reported. A careful search for these objects was made with the 26-inch refractor by several of the observers at Washington, but none of them could be verified.

An investigation of the orbits of the satellites of Mars by Professor Hall has been published as an appendix to the annual volume for 1875.

OBSERVATIONS

WITH THE

TRANSIT CIRCLE.

1877.

LXXXIV

ARY OF THE PRINCIPAL CONSTANTS USED IN REDUCING OBSERVATIONS MADE WITH THE TRANSIT CIRCLE IN 1877.

Approximate equatorial interval between any two of the consecutive threads I, II, III, IV, V, VI, VII . .	$12\frac{1}{4}^{s}$
One revolution of the microscope micrometers	30"
One revolution of the zenith-distance micrometer.	15".312
One revolution of the right-ascension micrometer	1^{s}.024

Corrections for Inclination and Distance of the Declination Threads.

From January 1 to August 4 (inclusive).					From August 6 to December 31 (inclusive).				
Vertical Thread.	Corr. for Double Threads.	Corr. for Thread A.	Corr. for Thread B.	Corr. for Thread *b*.	Vertical Thread.	Corr. for Double Threads.	Corr. for Thread A.	Corr. for Thread B.	Corr. for Thread *b*.
	"	' "	' "	' "		"	' "	' "	' "
I	− 1.17	+ 2 31.95	− 2 34.09	− 2 51.99	I	− 1.39	+ 2 31.37	− 2 34.69	− 2 56.93
II	0.78	32.34	33.60	51.45	II	0.93	31.83	34.23	55.87
III	− 0.39	32.72	33.10	50.90	III	− 0.47	32.29	33.77	55.41
IV	0.00	33.11	32.61	50.36	IV	0.00	32.76	33.30	54.94
V	+ 0.39	33.50	32.12	49.82	V	+ 0.47	33.23	32.83	54.47
VI	0.78	33.88	31.62	49.27	VI	0.93	33.69	32.37	54.01
VII	+ 1.17	+ 2 34.27	− 2 31.13	− 2 48.73	VII	+ 1.39	+ 2 34.15	− 2 31.91	− 2 53.55

Constant { Added to reduction to meridian Subtracted from zenith-point correction }	1".80
Adopted latitude of the Transit Circle	+ 38° 53' 38".80
One division of the hanging level	0^{s}.580
Position of the instrument	Clamp east.

Circle B, on the west end of the axis, was used this year in observing; the reading of its horizontal microscope being 45° 4' when the telescope was pointed to the zenith.

In reversing the instrument at the beginning of the year, the notation of the vertical threads is also reversed so that the first thread reached by an equatorial star is always called thread I.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH POLA DISTANCE.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″
Jan. 23	1	α Lyræ	9	32 45.76	+ 0.02	− **0.54**	0 9 46.08	+ 3 56.26	+ 0.2	18 32 45.21	0.00	51 20 3.7
E.	2	β Lyræ	5	45 31.90	− 0.07	− **0.60**	5 35 43.95	+ 4 48.65	+ 6.0	18 45 31.86	+ 0.07	56 46 59.5
	3	Sun I	9	27 55.09	− 0.75	− 0.50	57 52 . .	. .	. .	20 27 53.84	. .	. . . .
	4	Sun II	9	30 13.18	− 0.75	− 0.50	57 52 . .	. .	. .	20 30 11.93	. .	. . . .
	5	α Piscis Aust.	9	50 52.20	− 0.92	− **0.46**	69 3 50.75	+ 3 45.88	+ 2 38.9	22 50 50.87	+ 0.06	120 16 36.0
	6	α Pegasi	9	58 38.18	− 0.33	− **0.35**	24 15 42.10	+ 4 52.31	+ 27.5	22 58 37.44	− 0.04	75 27 23.1
	7	Lal., (F) 519.	5	26 20.48	+ 8.83	− 0.24	312 33 45.40	+ 5 13.82	− 1 7.2	3 26 29.07	− 4.79	3 44 13.2
	8	η Tauri	9	40 11.93	− 0.23	− **0.13**	15 5 46.85	+ 3 59.10	+ 16.8	3 40 11.48	− 0.08	66 16 24.0
	9	ζ Persei	9	46 25.68	− 0.10	− **0.23**	7 17 47.10	+ 4 29.19	+ 8.0	3 46 25.37	+ 0.04	58 28 45.5
	10	γ¹ Eridani	9	52 19.64	− 0.69	− **0.27**	52 39 54.28	+ 3 59.34	+ 1 21.4	3 52 18.74	+ 0.09	103 51 36.2
	11	B. A. C. 5352, S. P.	5	56 21.76	− 5.60	− 0.20	302 9 43.80	+ 4 1.83	− 1 38.2	3 56 15.96	+ 3.81	353 18 28 6
	12	Moon I	9	7 29.53	− 0.20	− 0.19	12 48 . .	. .	. .	4 7 29.14	+75.22	. . . .
	13	δ Ursæ Min., S. P.	9	11 47.79	−10.60	− 0.02	305 28 . .	. .	. .	18 11 37.17	+ 0.28	. . . .
	14	O. Arg. N. 6808.	3	19 12.40	+ 3.32	− 0.02	319 8 . .	. .	. .	6 19 15.70	− 8.80	. . . .
	15	23 (H.) Camelop.	9	25 18.69	+ 3.30	− 0.01	319 8 . .	. .	. .	6 25 21.98	− 8.97	. . . .
	16	γ Geminorum	9	30 38.68	− 0.33	− **0,04**	22 18 . .	. .	. .	6 30 38.35	+ 0.01	. . . .
	17	51 Cephei	9	42 36.54	+12.06	+ 0.02	311 36 . .	. .	. .	6 42 48.62	+ 0.46	. . . .
	18	ε Canis Majoris	9	53 50.20	− 0.92	+ **0.07**	67 36 . .	. .	. .	6 53 49.31	− 0.09	. . . .
F.	19	α Ophiuchi	8	29 13.02	− 0.36	+ **0.40**	26 9 50.32	+ 4 32.02	+ 30.8	17 29 13.06	+ 0.04	77 21 14.3
	20	ω Draconis	9	37 36.20	+ 1.17	+ 0.40	330 1 46.72	+ 3 59.40	− 35.9	17 37 37.77	+ 0.14	21 11 31.4
	21	μ Herculis	4	41 37.77	− 0.15	+ **0.42**	11 1 54.45	+ 4 15.50	+ 12.3	17 41 38.02	+ 0.02	62 12 43.5
	22	α Lyræ	9	32 44.83	+ 0.05	+ **0.38**	0 9 58.80	+ 3 47.53	+ 0.2	18 32 45.27	+ 0.04	51 20 7.7
	23	β Lyræ	9	45 30.93	− 0.05	+ **0.36**	5 35 51.72	+ 4 43.21	+ 6.2	18 45 31.27	+ 0.07	56 47 2.3
	24	Venus S.	.	. . . .	. .	. .	61 31 52.72	+ 4 13.93	+ 1 54.4	. . . .	. .	112 44 22.2
	25	Venus II, N.	9	46 37.67	− 0.83	+ 0.39	61 31 52.72	+ 3 59.30	+ 1 54.4	18 46 37.23	− 0.42	112 44 7.6
	26	δ Draconis	5	12 26.30	+ 1.12	+ 0.39	331 23 52.25	+ 3 54.06	− 33.7	19 12 27.81	+ 0.23	22 33 33.8
	27	α Aquilæ	9	44 46.11	− 0.40	+ **0.42**	30 15 52.52	+ 4 41.28	+ 36.1	19 44 46.10	+ 0.01	81 27 31.1
25	28	α Ceti	9	55 53.16	− 0.47	− **0.82**	35 11 50.15	+ 4 39.82	+ 43.6	2 55 51.90	+ 0.04	86 23 34.8
F.	29	48 Cephei	5	4 46.42	+ 2.47	− 0.78	321 33 49.12	+ 3 27.57	− 48.8	3 4 48.11	+ 0.45	12 42 49.1
	30	Taylor 1144	9	15 4.32	− 1.23	− 0.77	82 13 48.85	+ 5 16.20	+ 7 13.6	3 15 2.32	− 1.24	133 32 39.5
	31	B. A. C. 1074	6	21 13.60	− 1.07	− 0.76	75 5 54.55	+ 5 13.20	+ 3 49.9	3 21 11.77	− 1.19	126 21 13.9
	32	Lacaille 1103	7	21 16.92	− 1.07	− 0.76	75 5 54.55	+ 7 24 55	+ 3 50.5	3 21 15.09	− 1.19	126 23 30.8
	33	B. A. C. 1085	9	23 29.87	− 1.07	− 0.76	75 5 54.55	+ 0 51.82	+ 3 48.9	3 23 28.04	− 1.20	126 16 56.5
	34	B. A. C. 1145	9	36 51.36	− 1.17	− 0.74	79 49 51.12	+ 8 7.22	+ 5 38.3	3 36 49.45	− 1.32	131 9 57.8
	35	B. A. C. 1167	9	39 48.38	− 1.17	− 0.74	79 49 51.12	+ 1 6.94	+ 5 34.7	3 39 46.47	1.33	131 2 54.0
	36	B. A. C. 1227	6	50 7.89	− 1.16	− 0.73	79 27 52.30	+ 3 42.64	+ 5 25.1	3 50 6.00	− 1.38	130 43 21.2
	37	γ Tauri	9	12 50.01	− 0.32	− **0.72**	23 27 49.62	+ 5 30.51	+ 27.0	4 12 48.99	+ 0.04	74 40 8.3
	38	B. A. C. 1373	9	20 45.09	− 0.24	− 0.69	17 27 51.58	+ 4 41.17	+ 19.6	4 20 44.16	− 1.34	68 39 13.6
	39	ε Tauri	8	21 28.38	− 0.27	− **0.64**	19 53 52.78	+ 4 54.40	+ 22.5	4 21 27.42	− 0.04	71 5 30.9
	40	α Tauri	3	28 54.15	− 0.30	− **0.65**	22 33 47.32	+ 3 40.20	+ 25.8	4 28 53.17	− 0.04	73 44 14.5
	41	ι Aurigæ	9	49 1.47	− 0.06	− **0.66**	5 49 54.35	+ 5 18.06	+ 6.4	4 49 0.75	+ 0.02	57 1 40.0
	42	11 Orionis (R.)	.	. . . .	. .	. .	156 15 58.15	+ 4 52.26	− 27.2	. . . .	. .	74 45 58.0
	43	11 Orionis	.	. . . .	. .	. .	23 33 46.58	+ 5 25.79	+ 27.2	. . . .	. .	74 46 0.5
	44	α Aurigæ (R.)	.	. . . .	. .	. .	186 53 52.02	+ 4 54.11	+ 7.6	. . . .	. .	44 7 27.5
	45	α Aurigæ	.	. . . .	. .	. .	352 57 46.12	+ 3 30.54	− 7.6	. . . .	. .	44 7 30.3
	46	Moon I, N.	9	14 13.74	− 0.13	− 0.63	10 31 49.28	+ 3 34.16	+ 11.6	5 14 12.98	+77.99	61 41 56.2
	47	α Orionis	9	48 33.52	− 0.42	− **0.62**	31 26 . .	. .	. .	5 48 32.51	+ 0.01	. . . .
	48	δ Ursæ Min., S. P.	5	11 47.78	−11.45	− 0.57	305 27 51.75	+ 3 26.97	− 1 26.9	6 11 35.76	− 1.25	356 36 13.0
S.	49	α Ophiuchi	9	29 13.24	− 0.38	+ **0.22**	26 9 53.28	+ 4 26.58	+ 31.0	17 29 13.09	+ 0.05	77 21 12.1
	50	ω Draconis	5	37 36.27	− 1.31	+ 0.24	330 2 . .	. .	. .	17 37 37.82	+ 0.14	. . . .

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	29.99	31.5	29.8
8	30.18	25.0	23.0
21	30.32	23.2	22.2
27	30.34	28.0	26.3
30	30.26	29.5	26.6
36	30.26	28.0	25.2
48	30.25	26.8	23.0
49	30.30	20.9	18.4

For summary of the elements of reduction see page 3.

10, 22. Four bisections.
32, 45. One bisection.
46, 48. Three bisections.

ZENITH-POINT CORR.

No. 1 to 6 + 54.″02
No. 7 to 11 + 55.16
No. 19 to 27 + 56.15
No. 28 to 48 + 56.18
No. 49 to 50 + 53.87

No.	Parallax.	Semi-diam.	Defective Illumination.	S
	′ ″	′ ″	′ ″	
24	− 5.2	− 7.3	0.0	−
25	− 5.2	+ 7.3	. .	+
46	−10 50.2	+ 16 23.9	. .	+

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Jan. 25	1	μ Herculis	6	41 37.98	− 0.15	+ **0.25**	11 1 51.12	+ 4 16.25	+ 12.3	17 41 38.07	+ 0.03	62 12 40.9	+ 0.9
S.	2	γ Draconis (R.)	.	. . .	. .	. .	192 31 50.22	+ 4 10.73	+ 14.0	. . . .	. .	38 30 6.2	− 0.3
	3	γ Draconis	7	53 43.14	+ 0.37	+ 0.24	347 19 57.65	+ 4 2.99	− 14.0	17 53 43.75	+ 0.02	38 30 7.8	+ 1.3
	4	δ Ursæ Minoris	5	11 26.02	+11.35	+ 0.25	312 14 . .	. .	. .	18 11 37.62	+ 0.54	. . . .	. .
	5	α Lyræ	3	32 44.96	+ 0.07	+ **0.25**	0 9 51.52	+ 3 51.62	+ 0.2	18 32 45.28	+ 0.03	51 20 4.5	+ 0.2
	6	β Lyræ	6	45 31.12	+ 0.18	+ 0.25	5 35 49.95	+ 4 42 34	+ 6.2	18 45 31.55	+ 0.32	56 46 59.7	− 0.7
26	7	Sun I, N.	9	36 14.02	− 0.78	+ 0.29	57 3 57.28	+ 5 4.82	+ 1 33.8	20 36 13.53	. .	108 16 57.1	. .
	8	Sun II, S.	9	38 31.17	− 0.78	+ 0.29	57 37 51.05	+ 3 39.37	+ 1 35.9	20 38 30.68	. .	108 49 27.5	. .
	9	β Aquarii	8	25 4.82	− 0.59	+ **0.17**	44 53 50.50	+ 5 37.30	+ 1 0.4	21 25 4.53	+ 0.14	96 6 49.4	+ 2.3
	10	ε Pegasi	9	38 8.03	− 0.38	+ **0.31**	29 29 55.00	+ 4 35.50	+ 34.3	21 38 7.95	− 0.01	80 41 26.0	+ 4.3
	11	α Aquarii	9	59 27.60	− 0.51	+ **0.36**	39 43 50.60	+ 4 5.70	+ 50.3	21 59 27.40	+ 0.03	90 55 7.8	+ 2.5
	12	ζ Pegasi	9	35 19.02	− 0.36	+ **0.40**	28 37 50.15	+ 3 55.43	+ 33.0	22 35 18.98	+ 0.01	79 48 39.8	+ 1.9
	13	ι Cephei	5	45 13.49	+ 1.21	+ 0.32	333 15 51.98	+ 4 54.56	− 30.2	22 45 15.02	+ 0.12	24 26 37.5	+ 0.3
	14	γ Tauri	9	12 48.36	− 0.28	+ **0.88**	23 27 47.75	+ 5 33.19	+ 26.5	4 12 48.93	− 0.01	74 40 8.6	+ 3.1
	15	62^2 Tauri	9	16 35.53	− 0.15	+ 0.85	14 47 46.75	+ 4 39.04	+ 16.2	4 16 36.23	− 1.32	65 59 3.2	+12.0
	16	α Tauri	9	28 52.61	− 0.27	+ **0.85**	22 33 48.68	+ 3 40.25	+ 25.4	4 28 53.21	+ 0.01	73 44 15.5	+ 3.1
	17	ι Aurigæ	9	48 59.86	+ 0.01	+ **0.87**	5 49 52.90	+ 5 18.45	+ 6.3	4 49 0.76	+ 0.04	57 1 38.9	+ 3.1
	18	α Aurigæ (R.)	.	. . .	. .	. .	186 53 45.12	+ 5 0.52	+ 7.5	. . . .	. .	44 7 28.1	− 1.5
	19	α Aurigæ	.	. . .	. .	. .	352 57 48.68	+ 3 28.90	− 7.5	. . . .	. .	44 7 31.3	+ 1.7
	20	β Tauri (R.)	.	. . .	. .	. .	169 31 47.95	+ 5 2.12	− 11.2	. . . .	. .	61 29 42.3	− 0.5
	21	β Tauri	.	. . .	. .	. .	10 17 47.80	+ 5 23.34	+ 11.2	. . . .	. .	61 29 43.5	+ 0.7
	22	B. A. C. 1825	9	39 28 37	− 1.16	+ 0.94	78 9 49.60	+ 6 47.79	+ 4 48.0	5 39 28.15	1.75	129 27 46.6	− 3.0
	23	B. A C. 1842	9	41 22.63	− 1.16	+ 0.94	78 9 49.60	+ 0 55.18	+ 4 45.7	5 41 22.41	− 1.75	129 21 51.7	− 3.0
	24	B. A. C. 1889	9	48 23.67	− 1.12	+ 0.95	76 23 49.88	+ 5 12.17	+ 4 10.3	5 48 23.50	− 1.75	127 39 33.6	− 2.6
	25	Piazzi VI, 6.	9	2 55.11	− 1.23	+ 0.97	80 59 54.82	+ 4 38.08	+ 6 14.7	6 2 54.85	− 1.84	132 17 8.8	− 2.6
	26	δ Ursæ Min., S. P.	5	11 49.58	−12.92	+ 0.98	305 27 49.82	+ 3 27.44	− 1 25.8	18 11 37.64	+ 0.50	356 36 12.7	+ 2.1
	27	Moon I, N.	9	24 21.24	− 0.09	+ 0.99	10 41 46.08	+ 2 52.33	+ 11.6	6 24 22.14	+78.96	61 51 11.2	. .
	28	B. A. C. 2179	9	32 53.39	− 1.14	+ 1.00	76 47 49.32	+ 4 10.61	+ 4 18.1	6 32 53.25	− 1.84	128 2 39.2	− 1.5
	29	B. A. C. 2195	9	35 47.47	− 1.14	+ 1.00	76 47 49.32	+ 4 15.58	+ 4 18.2	6 35 47.33	− 1.85	128 2 44.3	− 1.4
	30	B. A. C. 2258	9	47 24.22	− 1.10	+ 1.02	74 49 52.65	+ 4 56.49	+ 3 44.7	6 47 24.14	− 1.84	126 4 55.0	− 1.0
	31	Weisse (2) 1656.	9	56 11.64	− 0.12	+ 1.02	11 47 48.02	+ 4 40.67	+ 12.9	6 56 12.54	− 2.20	62 59 2.8	+ 6.2
	32	Piazzi VI, 344	9	2 5.67	− 1.24	+ 1.03	80 51 50.00	+ 4 3.21	+ 6 10.0	7 2 5.46	− 1.92	132 8 24.4	− 0.9
	33	Piazzi VII, 137	9	25 57.50	− 0.98	+ 1.06	69 29 55.30	+ 3 16.79	+ 2 43.7	7 25 57.58	− 1.84	120 42 17.0	− 0.1
	34	B. A. C. 2543	7	35 9.23	− 1.14	+ 1.07	76 45 49.28	+ 5 8.17	+ 4 18.2	7 35 9.16	− 1.89	128 1 26.8	. .
	35	B. A. C. 2546	9	35 29.46	− 1.14	+ 1.07	76 45 49.28	+ 2 12.46	+ 4 17.2	7 35 29.39	− 1.89	127 58 40.1	0.0
	36	B. A. C. 2604	9	43 58.22	− 1.19	+ 1.08	79 3 50.18	+ 5 23.06	+ 5 12.2	7 43 58.11	− 1.91	130 20 46.6	+ 0.2
	37	B. A. C. 2614	9	45 4.06	− 1.19	+ 1.08	79 3 50.18	+ 8 7.19	+ 5 13.4	7 45 3.95	− 1.91	130 23 32.0	+ 0.2
	38	B. A. C. 2634	9	48 1.46	− 1.19	+ 1.08	79 3 50.18	+ 13.04	+ 5 9.8	7 48 1.35	− 1.91	130 15 34.2	+ 0.3
	39	Gallia	3	10 28.94	− 0.44	+ 1.10	33 41 50.38	+ 4 0.01	+ 41.2	8 10 29.60	. .	84 52 52.8	− 2.9
	40	B. A. C. 2933	9	34 41.62	− 1.11	+ 1.13	74 55 49.70	+ 4 33.94	+ 3 46.7	8 34 41.64	− 1.84	126 10 31.5	+ 0.9
	41	ε Hydræ	9	40 17.01	− 0.43	+ **1.13**	31 55 50.58	+ 5 3.99	+ 38.5	8 40 17.72	− 0.04	83 7 54.3	+ 2.1
	42	ι Ursæ Maj. (R.)	.	. . .	. .	. .	189 33 46.62	+ 3 46.12	+ 10.5	. . . .	. .	41 28 38.0	− 1.0
	43	ι Ursæ Majoris	.	. . .	. .	. .	350 17 49.98	+ 4 39.71	− 10.5	. . . .	. .	41 28 40.4	+ 1.4
	44	κ Cancri	9	1 6.29	− 0.37	+ **1.19**	27 39 52.58	+ 3 33.11	+ 32.4	9 1 7.08	0.00	78 50 19.3	+ 1.3
	45	B. A. C. 3158	9	10 4.77	− 1.14	+ 1.17	75 51 50.25	+ 3 16.06	+ 4 1.5	9 10 4.80	− 1.78	127 5 29.0	+ 1.5
	46	α Hydræ	9	21 33.97	− 0.64	+ **1.07**	46 55 53.12	+ 4 17.33	+ 1 6.0	9 21 34.51	+ 0.09	98 7 37.6	+ 1.5
	47	B. A. C. 3267	9	27 28.12	− 1.20	+ 1.19	78 51 51.32	+ 3 2.65	+ 5 6.0	9 27 28.11	− 1.75	130 6 21.2	+ 2.0
	48	ε Leonis	9	38 53.20	− 0.19	+ **1.28**	14 27 47.65	+ 5 18.24	+ 16.0	9 38 54.21	− 0.11	65 39 43.1	+ 0.9
	49	Uranus	5	43 40.30	− 0.34	+ 1.20	24 19 55.75	+ 4 55.73	+ 28.0	9 43 41.16	. .	75 31 40.7	. .
P.	50	δ Ursæ Minoris	1	11 25.40	+10.77	+ 1.28	312 14 . .	. .	. .	18 11 37.45	+ 0.21	. . . .	. .

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
8	30.26	32.0	34.0
9	30.24	33.8	36.0
15	30.18	35.0	32.3
17	30.18	34.2	31.2
24	30.16	32.2	28.2
30	30.14	30.2	26.7
42	30.11	28.4	24.9
49	30.09	27.8	25.0

For summary of the elements of reduction see page 3.

12, 16, 37. One bisection.
26, 27. Three bisections.

ZENITH-POINT CORR.

No. 1 to 13 + 53.87″
No. 14 to 49 + 53.81

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	− 7.5	+ 16 15.2	. .	+ 16 7.7
8	− 7.6	− 16 15.2	. .	− 16 22.8
27	−11 8.1	+ 16 36.4	. .	+ 5 28.3
49	− 0.2	. .	. .	[illegible]

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Jan. 26	1	α Lyræ . . .	9	32 43.80	+ 0.16	+ **1.34**	0 9 52.20	+ 3 50.08	+ 0.2	18 32 45.26	− 0.01	51 20 3.7	− 0.9
P.	2	β Lyræ . . .	5	45 29.89	+ 0.06	+ **1.34**	5 35 49.42	+ 4 42.92	+ 6.0	18 45 31.26	+ 0.01	56 46 59.5	− 1.1
	3	Venus II, N. .	9	57 24.11	− 0.68	+ 1.32	61 23 54.18	+ 4 7.62	+ 1 50.4	18 57 24.75	− 0.42	112 36 13.4	. .
	4	Venus, S. . .	.	. . .	. .	.	61 23 54.18	+ 4 19 28	+ 1 50.4	. . . .	. .	112 36 25.1	. .
	5	ζ Aquilæ . . .	9	59 43.64	− 0.22	+ **1 25**	25 7 52.08	+ 4 37.61	+ 28.4	18 59 44.74	+ 0.18	76 19 19.3	+ 1.8
27	6	Sun I, N. . .	9	40 21.12	− 0.60	+ 1.40	56 49 50.70	+ 3 40.14	+ 1 30.8	20 40 21.92	. .	108 1 22.8	. .
	7	Sun II, S. . .	9	42 38.46	− 0.60	+ 1.40	57 21 50.98	+ 4 8.14	+ 1 32.6	20 42 39.26	. .	108 33 52.9	. .
	8	α Piscis Aust. .	9	50 50.11	− 0.80	+ **1.50**	69 3 51.62	+ 3 51.61	+ 2 31.0	22 50 50.81	+ 0.01	120 16 35.4	+ 2.1
	9	ε Canis Majoris .	9	53 48.08	− 0.78	+ **2.04**	67 35 49.88	+ 3 47.30	+ 2 24.7	6 53 49.32	− 0.07	118 48 23.1	+ 1.5
	10	δ Canis Majoris .	9	3 24.01	− 0.75	+ **1.96**	64 59 54.10	+ 3 35.12	+ 2 8.2	7 3 25.29	− 0.02	116 11 58.6	+ 3.1
	11	Taylor 2910. .	9	7 20.39	− 0.82	+ 2.04	69 23 53.18	+ 4 9.17	+ 2 39.0	7 7 21.61	− 1.82	120 37 2.6	− 0.6
	12	δ Geminorum . .	9	12 46.79	− 0.14	+ **2.09**	16 35 48.95	+ 5 3.03	+ 18.0	7 12 48.69	− 0.09	67 47 31.2	+ 1.8
	13	Piazzi VII, 67 .	5	18 5.81	+ 1.26	+ 2.05	330 7 52.15	+ 3 22.62	− 34.4	7 18 9.12	− 0.19	21 17 1.6	− 0.1
	14	Piazzi VII, 137 .	9	25 56.23	− 0.82	+ 2.06	69 29 53.58	+ 3 24.37	+ 2 39.9	7 25 57.47	− 1.84	120 42 19.1	− 0.4
	15	Moon I, N. . .	9	34 27.44	− 0.10	+ 2.07	13 7 51.75	+ 4 14.92	+ 14.1	7 34 29.41	+77.63	64 18 42.0	. .
	16	Moon II. . .	9	37 0.31	− 0.10	+ 2.07	13 24 . .	. .	. .	7 37 2.28	−75.24	. . . .	. .
	17	λ Ursæ Min., S. P.	3	46 12.93	−35.08	+ 2.08	307 45 48.20	+ 5 9.50	− 1 17.2	19 45 39.93	+ 0.47	358 56 1.7	+ 1.7
	18	B. A. C. 2659 .	9	53 44.57	− 0.21	+ 2.09	21 9 49.82	+ 4 46.41	+ 23.4	7 53 46.45	− 2.16	72 21 20.8	+ 0.6
	19	Gallia . . .	9	9 35.33	− 0.35	+ 2.11	33 27 51.68	+ 5 21.56	+ 39.9	8 9 37.09	. .	84 40 14.3	− 2.9
	20	κ Cephei, S. P. .	5	12 53.20	− 5.44	+ 2.12	295 11 50.30	+ 4 8.70	− 2 1.3	20 12 49.88	− 2.15	347 20 18.9	+ 2.8
	21	B. A. C. 2819 (R.)	.	. . .	. .	. .	202 9 49.25	+ 3 48.91	+ 24.6	. . . .	. .	28 52 18.4	+ 2.6
	22	B. A. C. 2819 .	.	. . .	. .	. .	337 41 51.42	+ 4 33.25	− 24.6	. . . .	. .	28 52 21.3	+ 2.6
	23	B. A. C. 2901 (R.)	.	. . .	. .	. .	147 9 49.98	+ 5 1.77	− 38 7	. . . .	. .	83 52 8.1	− 0.8
	24	B. A. C 2901 . .	.	. . .	. .	. .	32 39 50.88	+ 5 17.84	+ 38.7	. . . .	. .	83 52 8.6	− 0.8
	25	B. A. C. 2974 .	9	40 8.49	− 0 92	+ 2.15	75 27 51.65	+ 4 3.36	+ 3 49.5	8 40 9.72	− 1.84	126 42 5.7	+ 0.7
	26	12-y. C. 1879, S. P.	3	52 58.18	− 4.08	+ 2.17	298 55 51.62	+ 4 58.98	− 1 48.2	20 52 56.27	+ 0.09	350 5 23.6	+ 2.6
	27	Weisse 774 . .	7	36 38.08	− 0.44	+ 2.22	40 29 50.22	+ 3 51.11	+ 51.6	9 36 39.86	− 1.86	91 40 54.1	− 3.2
	28	Anonymous .	7	36 45.73	− 0.44	+ 2.22	40 29 50.22	+ 5 48.23	+ 51.6	9 36 47.51	− 1.86	91 42 51.2	− 3.2
	29	Uranus . . .	9	43 29.39	− 0.24	+ 2.23	24 19 49.02	+ 4 12.78	+ 27.4	9 43 31.38	. .	75 30 50.4	− 0.2
	30	79 Draconis, S. P. .	6	51 14.94	− 2.51	+ 2.24	291 59 51.02	+ 3 36.12	− 2 28.0	21 51 14.67	+ 0.22	343 7 20.3	+ 2.7
	31	α Leonis (R.) . .	.	. . .	. .	. .	153 35 47.75	+ 5 0.06	− 29.9	. . . .	. .	77 26 3.3	+ 1.9
	32	α Leonis . . .	2	1 49.13	− 0.27	+ **2.35**	26 13 47.12	+ 5 24.26	+ 29.9	10 1 51.12	− 0.13	77 26 2.5	+ 1.1
	33	Weisse (2) 234 .	8	12 56.37	− 0.17	+ 2.26	18 19 51.52	+ 4 21.44	+ 20.1	10 12 58.46	− 2.12	69 30 54.3	− 7.7
	34	γ^1 Leonis . . .	8	13 11.36	− 0.17	+ **2.29**	18 19 51.52	+ 5 49.19	+ 20.1	10 13 13.45	− 0.01	69 32 22.0	+ 2.4
	35	B. A. C. 3553 .	9	17 18.81	− 0.45	+ 2.27	41 49 51.80	+ 4 16.63	+ 54.2	10 17 20.63	− 1.76	93 1 23.8	− 4.5
	36	226 Cephei, S. P. .	5	30 0.86	− 2.90	+ 2.29	294 27 50.42	+ 3 45.02	− 2 11.9	22 30 0.25	+ 0.11	345 35 41.7	+ 2.5
	37	l Leonis . . .	9	42 47.36	− 0.28	+ **2.26**	27 37 54.08	+ 3 38 32	+ 31.8	10 42 49.38	+ 0.07	78 48 25.4	+ 2.4
	38	ι Cephei, S. P. .	9	45 14.70	− 1.18	+ 2.31	284 25 47.98	+ 5 4.71	− 3 50.1	22 45 15.21	+ 0.34	335 33 23.8	+ 1.3
	39	α Ursæ Maj. (R.) .	.	. . .	. .	. .	203 25 51.18	+ 4 43.57	+ 26.4	. . . .	. .	27 35 20.0	− 2.8
	40	Ursæ Majoris .	5	56 8.19	+ 0.83	+ 2.32	336 23 52.18	+ 5 37.30	− 26.4	10 56 11.34	− 0.08	27 35 24.3	+ 1.5
	41	B. A. C. 3822 .	9	3 58.89	− 0.84	+ 2.33	70 27 55.62	+ 4 52.53	+ 2 50.0	11 4 0.38	− 1.43	121 41 59.4	+ 0.5
	42	δ Leonis . . .	9	7 33 63	− 0.15	+ **2.38**	17 37 51.52	+ 3 49.38	+ 19.4	11 7 35.81	− 0.10	68 48 21.5	+ 1.2
	43	δ Crateris . . .	9	13 11.34	− 0.59	+ **2.28**	52 55 52.85	+ 3 17.67	+ 1 20.3	11 13 13.09	+ 0.06	104 6 52.0	+ 1.5
	44	B. A. C. 3890 .	9	19 31.83	− 0.90	+ 2.35	74 9 49.62	+ 3 32.38	+ 3 31.6	11 19 33.28	− 1.36	125 23 14.8	+ 1.3
	45	τ Leonis . . .	9	21 36.42	− 0.38	+ **2.27**	35 15 51.98	+ 5 12.81	+ 43.0	11 21 38.39	+ 0.05	86 28 9.0	+ 1.4
	46	Taylor 6170 . .	9	25 14.22	− 1.08	+ 2.35	82 59 49.35	+ 3 21.78	+ 7 47.2	11 25 15.49	− 1.33	134 17 19.5	+ 3.4
	47	B. A. C. 3915 .	9	30 28.98	− 0.86	+ 2.36	71 39 51.52	+ 4 4.71	+ 3 2.0	11 30 30 48	− 1.32	122 53 19.4	+ 0.6
	48	γ Cephei, S. P. .	2	34 13.98	− 3.17	+ 2.37	205 47 49.85	+ 4 54.67	− 2 4.6	23 34 13.18	+ 0.48	346 57 1.1	− 0.3
28	49	ψ^1 Draconis, S. P. .	9	44 3.32	− 2.88	+ 3.76	291 3 48.05	+ 4 39.68	− 2 36.7	17 44 4.20	− 0.16	342 12 12.2	+ 3.5
E.	50	ψ^2 Draconis, S. P. .	9	44 5.12	− 2.88	+ 3.76	291 3 48.05	+ 5 8.66	− 2 36.7	17 44 6.00	+ 3.36	342 12 41.2	+22.8

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.04	32.8	32.7
5	30.04	34.6	34.8
7	30.02	40.0	41.6
8	29.99	48.6	51.8
9	30.13	39.2	38.9
15	30.15	38.6	37.4
22	30.16	38.1	37.3
28	30.19	37.4	36.3
29	30.19	37.4	36.3
36	30.21	36.6	35.4
48	30.23	35.4	33.9

For summary of the elements of reduction see page 3.

1, 18, 29, 37. Four bisections.
15, 17. Three bisections.
36, 48. One bisection.

ZENITH-POINT CORR.

No. 1 to 8 + 53.77″
No. 9 to 48 + 53.67
No. 49 to 50 + 55.61

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
3	− 5.2	+ 5.9	. .	+ 0.7
4	− 5.2	− 5.9	. .	− 11.0
6	− 7.5	+ 16 15.0	. .	+ 16 7.5
7	− 7.5	− 16 15.1	. .	− 16 22.6
15	−13 47.8	+ 16 44.4	. .	+ 2 56.6
29	− 0.2	. .	. .	− 0.2

E D R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
7.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
28	1	α Orionis . . .	9	48 29.14	− 0.43	+ 3.76	31 25 52.72	+ 4 10.11	+ 37.4	. . . .	. .	82 37 1.4	+ 3.8
	2	B. A. C. 1939 (R.)	.	. . .	. .	. .	161 9 46.22	+ 5 25.41	− 20.7	. . . .	. .	69 51 30.2	+ 8.0
	3	B. A. C. 1939 .	.	. . .	. .	. .	18 39 38.12	+ 5 11.78	+ 20.7	. . . .	. .	69 51 31.8	+ 8.0
	4	δ Ursæ Min., s. P.	8	11 44.60	−10.78	+ 3.78	305 27 45.60	+ 3 31.88	− 1 25.4	18 11 37.60	+ 0.18	356 36 13.3	+ 3.3
	5	B. A. C. 2098 .	8	21 49.69	− 1.11	+ 3.79	79 41 51.52	+ 40.82	+ 5 25.7	6 21 52.37	− 1.84	130 54 19.2	− 2.5
	6	B. A. C. 2117 .	9	24 45.57	− 1.11	+ 3.79	79 41 51.52	+ 6 8.02	+ 5 28.5	6 24 48.25	− 1.84	130 59 49.2	− 2.4
	7	B. A. C. 2179 .	9	32 50.66	− 1.04	+ 3.80	76 47 48.08	+ 4 16.59	+ 4 16.6	6 32 53.42	− 1.82	128 2 42.5	− 2.0
	8	B. A. C. 2195 .	9	35 44.78	− 1.04	+ 3.80	76 47 48.08	+ 4 20.88	+ 4 16.6	6 35 47.54	− 1.83	128 2 46.8	− 1.9
	9	51 Cephei . . .	9	42 32.21	+12.22	+ 3.81	311 35 39.88	+ 4 55.05	− 1 8.6	6 42 48.24	+ 0.35	2 45 47.5	+ 0.8
	10	ε Canis Majoris .	9	53 46.52	− 0.89	+ **3.70**	67 35 49.88	+ 3 45.73	+ 2 27.7	6 53 49.44	+ 0.06	118 48 24.5	+ 2.6
	11	Weisse (2) 1656.	5	56 8.75	− 0.19	+ 3.82	11 47 42.95	+ 4 46.33	+ 12.8	6 56 12.38	− 2.20	62 59 3.3	+ 6.3
	12	δ Canis Majoris .	9	3 22.34	− 0.85	+ **3.73**	64 59 56.92	+ 3 31.33	+ 2 10.7	7 3 25.31	+ 0.04	116 12 0.1	+ 4.3
	13	Taylor 2910 . .	9	7 18.74	− 0.92	+ 3.83	69 23 51.22	+ 4 8.11	+ 2 41.9	7 7 21.65	− 1.82	120 37 2.4	− 0.9
	14	δ Geminorum. .	9	12 45.13	− 0.25	+ **3.86**	16 35 49.52	+ 5 2.63	+ 18.3	7 12 48.71	− 0.07	67 47 31.7	+ 2.3
	15	α^1 Geminorum. .	6	26 43.29	− 0.11	+ 3.84	6 39 49.12	+ 4 19.41	+ 7.2	7 26 47.02	− 2.43	57 50 36.9	+ 4.9
	16	α^2 Geminorum. .	5	26 43.69	− 0.11	+ **3.88**	6 39 49.12	+ 4 16.66	+ 7.2	7 26 47.42	+ 0.26	57 50 34.2	+ 1.9
	17	α Canis Minoris .	9	32 50.22	− 0.46	+ **3.96**	33 15 49.42	+ 4 49.53	+ 40.2	7 32 53.61	− 0.21	84 27 40.4	+ 1.0
	18	β Geminorum. .	9	37 45.86	− 0.17	+ **3.93**	10 29 51.25	+ 4 17.37	+ 11.4	7 37 49.55	− 0.09	61 40 41.2	+ 3.2
	19	B. A. C. 2609 (R.)	.	. . .	. .	. .	188 54 44.92	+ 5 25.13	+ 9.7	. . . .	. .	42 7 1.5	+ 5.1
	20	B. A. C. 2609 .	.	. . .	. .	. .	350 55 44.70	+ 5 6.76	− 9.7	. . . .	. .	42 7 3.0	+ 5.1
	21	Gallia . . .	9	8 41.97	− 0.46	+ 3.88	33 13 51.00	+ 6 36.47	+ 40.2	8 8 45.39	. .	84 27 28.9	− 2.8
	22	B. A. C. 2820 .	9	18 43.24	− 1.05	+ 3.89	76 37 51.55	+ 5 1.78	+ 4 14.2	8 18 46.08	− 1.87	127 53 28.7	+ 0.2
	23	Lacaille 3373 .	5	26 32.57	− 1.06	+ 3.89	77 23 51.90	+ 4 8.22	+ 4 29.4	8 26 35.40	− 1.87	128 38 50.7	+ 0.3
	24	B. A. C. 2877 .	5	26 51.27	− 1.06	+ 3.89	77 23 51.90	+ 4 16.53	+ 4 29.5	8 26 54.10	− 1.87	128 38 59.1	+ 0.3
	25	B. A. C. 2933 .	9	34 38.76	− 1.01	+ 3.90	74 55 51.05	+ 4 34.78	+ 3 45.1	8 34 41.65	− 1.85	126 10 32.1	+ 0.3
	26	Moon I, N. . .	9	41 21.04	− 0.26	+ 3.91	17 39 50.62	+ 3 42.40	+ 19.6	8 41 24.69	+65.23	68 50 13.8	. .
	27	Moon II. . .	9	43 51.47	− 0.26	+ 3.91	17 24 . .	. .	. .	8 43 55.12	−65.20	. . . .	. .
	28	α Lyræ. . . .	9	32 40.77	+ 0.06	+ **4.52**	0 9 49.62	+ 3 51.23	+ 0.2	18 32 45.26	− 0.06	51 20 2.2	− 2.9
	29	β Lyræ. . . .	9	45 26.84	− 0.03	+ **4.52**	5 35 47.52	+ 4 45.54	+ 6.0	18 45 31.25	− 0.04	56 47 0.3	− 0.8
	30	B. A. C. 6487 .	9	53 57.50	− 0.27	+ 4.45	23 53 47.65	+ 5 28.44	+ 27.0	18 54 1.68	+ 0.72	75 6 4.3	−14.5
	31	ζ Aquilæ . . .	9	59 40.60	− 0.28	+ **4.39**	25 7 48.38	+ 4 40.50	+ 28.5	18 59 44.78	+ 0.18	76 19 18.6	+ 0.8
	32	Venus II, N. .	9	8 6.92	− 0.69	+ 4.47	61 13 46.92	+ 3 35.87	+ 1 49.9	19 8 10.70	− 0.42	112 25 33.9	. .
	33	Venus S. . .	.	. . .	. .	. .	61 13 46.92	+ 3 50.64	+ 1 50.0	. . . .	. .	112 25 48.8	. .
	34	δ Draconis . .	5	12 22.09	+ 1.05	+ 4.47	331 23 45.35	+ 3 59.65	− 32.9	19 12 27.61	− 0.07	22 33 33.3	+ 0.3
	35	δ Aquilæ . . .	8	19 13.10	− 0.40	+ **4.46**	35 55 48.60	+ 5 1.18	+ 43.9	19 19 17.18	+ 0.09	87 7 54.9	− 0.6
	36	B. A. C. 6690 .	9	25 40.23	− 0.10	+ 4.48	11 5 47.58	+ 5 43.44	+ 11.9	19 25 44.31	+ 1.04	62 18 4.1	−13.7
	37	γ Aquilæ . . .	9	40 19.79	− 0.31	+ **4.49**	28 29 51.40	+ 4 32.68	+ 32.8	19 40 23.98	+ 0.04	79 41 18.1	+ 0.4
	38	α Aquilæ . . .	9	44 42.07	− 0.32	+ **4.43**	30 15 49.08	+ 4 44.68	+ 35.2	19 44 46.25	+ 0.11	81 27 30.2	+ 0.5
29	39	Sun I, S. . .	5	48 33.08	− 0.61	+ 4.57	56 49 52.90	+ 4 4.40	+ 1 31.5	20 48 37.04	. .	108 1 50.0	. .
	40	Sun II, N. . .	9	50 49.76	− 0.61	+ 4.57	56 17 53.42	+ 3 35.29	+ 1 29.6	20 50 53.72	. .	107 29 19.5	. .
	41	ζ Pegasi . . .	7	35 14.64	− 0.26	+ **4.68**	28 37 45.40	+ 4 0.40	+ 32.2	22 35 19.05	+ 0.08	79 48 39.2	+ 1.0
	42	α Andromedæ .	9	1 56.59	− 0.03	+ **4.81**	10 25 46.38	+ 2 55.66	+ 10.8	0 2 1.32	− 0.02	61 35 14.0	+ 2.6
	43	γ Pegasi . . .	9	6 49.40	− 0.21	+ **4.71**	24 17 47.75	+ 5 25.49	+ 26.6	0 6 53.95	+ 0.06	75 30 1.0	+ 4.0
	44	η Tauri . . .	6	40 6.66	− 0.14	+ **4.99**	15 5 43.18	+ 4 5.39	+ 16.2	3 40 11.49	− 0.01	66 16 26.0	+ 2.1
	45	ζ Persei . . .	9	46 20.26	− 0.03	+ **5.05**	7 17 45.85	+ 4 31.64	+ 7.7	3 46 25.22	− 0.04	58 28 46.4	+ 1.1
	46	γ Eridani . . .	9	52 14.26	− 0.58	+ **4.94**	52 39 48.62	+ 4 5.52	+ 1 18.6	3 52 18.68	+ 0.09	103 51 33.9	+ 0.3
	47	51 Tauri . . .	9	11 2.89	− 0.17	+ 5.06	17 31 47.62	+ 4 45.50	+ 19.0	4 11 7.78	− 1.23	68 43 13.3	+11.2
	48	53 Tauri . . .	9	12 7.56	− 0.18	+ 5.07	17 57 46.82	+ 4 48.18	+ 19.6	4 12 12.45	− 1.24	69 9 15.8	+11.0
	49	62^1 Tauri . . .	6	16 29.22	− 0.14	+ 5.08	14 47 46.68	+ 4 28.83	+ 15.9	4 16 34.16	− 1.28	65 58 52.6	+12.0
	50	62^2 Tauri . . .	5	16 31.22	− 0.14	+ 5.08	14 47 46.68	+ 4 39.73	+ 16.0	4 16 36.16	− 1.28	65 59 3.6	+12.0

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.24	34.0	31.5
30.22	33.0	30.0
30.20	35.2	34.0
30.17	40.3	40.5
30.21	63.5	48.5
30.20	49.5	50.0
30.21	42.5	40.0

For summary of the elements of reduction see page 3.

4, 9, 26. Three bisections.

ZENITH-POINT CORR.

No. 4 to 27 + 55.″61
No. 28 to 43 + 53.42
No. 44 to 50 + 54.56

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	−18 30.3	+ 16 46.8	. .	− 1 43.5
32	− 5.2	+ 7.5	. .	+ 2.3
33	− 5.2	− 7.5	+ 0.1	− 12.6
39	− 7.5	− 16 15.2	. .	− 16 22.7
40	− 7.4	+ 16 15.2	. .	+ 16 7.8

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Jan. 29	1	Anonymous	8	34 3.37	− 0.16	+ 5.13	16 51 48.05	+ 3 52.32	+ 18.3	4 34 8.34	− 1.38	68 2 19.9	+1
F.	2	ε Ursæ Min., S. P.	5	58 31.59	− 4.90	+ 5.20	301 5 47.20	+ 3 18.99	− 1 39.4	16 58 31.89	− 0.20	352 13 48.0	+
	3	α Aurigæ	9	7 32.68	+ 0.23	+ **5.35**	352 57 44.48	+ 3 31.48	− 7.4	5 7 38.13	− 0.14	44 7 29.8	+
	4	δ Orionis	9	25 40.22	− 0.42	+ **5.14**	39 11 48.52	+ 4 28.18	+ 49.4	5 25 45.08	+ 0.11	90 23 27.3	+
S.	5	μ Herculis	8	41 32.05	− 0.20	+ **6.33**	11 1 48.32	+ 4 20.42	+ 12.1	17 41 38.15	+ 0.01	62 12 42.0	+
	6	γ Draconis (R.)	.	. . .	. .	. .	192 31 53.95	+ 4 6.67	+ 13.7	. . . .	. .	38 30 6.9	−
	7	γ Draconis	.	. . .	. .	. .	347 19 46.92	+ 4 13.46	− 13.7	. . . .	. .	38 30 7.9	+
	8	δ Ursæ Minoris	4	11 21.00	+10.44	+ 6.32	312 14 . .	. .	. .	18 11 37.76	+ 0.08	. . . .	
	9	α Lyræ	9	32 38.99	+ 0.10	+ **6 28**	0 9 54.78	+ 3 49.29	+ 0.2	18 32 45.42	+ 0.08	51 20 5.5	+
	10	β Lyræ	9	45 25.07	− 0.08	+ **6.36**	5 35 49.80	+ 4 44.52	+ 6.1	18 45 31.32	+ 0.01	56 47 1.6	+
	11	ζ Aquilæ	9	59 38.76	− 0.36	+ **6.33**	25 7 59.25	+ 4 30.90	+ 28.7	18 59 44.74	+ 0.12	76 19 20.1	+
	12	Venus I, S.	6	13 26.85	− 0.80	+ 6.35	61 8 1.98	+ 3 16.17	+ 1 50.0	19 13 32.40	+ 0.33	112 19 29.4	
	13	Venus II, N.	5	13 27.58	− 0.80	+ 6.35	61 8 1.98	+ 3 4.74	+ 1 50.0	19 13 33.13	− 0.40	112 19 17.9	
30	14	Sun I, N.	9	52 37.01	− 0.71	+ 6.40	55 59 51.48	+ 5 8.31	+ 1 28.5	20 52 42.70	. .	107 12 49.5	
	15	Sun II, S.	9	54 53.76	− 0.71	+ 6.40	56 31 50.18	+ 5 37.26	+ 1 30.3	20 54 59.45	. .	107 45 18.9	
	16	ε Pegasi	9	38 1.99	− 0.37	+ **6.36**	29 29 57.68	+ 4 33.48	+ 33.6	21 38 8.04	+ 0.06	80 41 26.0	+
	17	α Aquarii	9	59 21.48	− 0.50	+ **6.42**	39 43 59.35	+ 3 58.19	+ 49.2	21 59 27.41	+ 0.03	90 55 7.9	+
	18	ζ Pegasi	9	35 12.90	− 0.35	+ **6.51**	28 37 53.20	+ 3 56.13	+ 32.4	22 35 19.00	+ 0.03	79 48 42.9	+
	19	B. A. C. 8032 (R.)	.	. . .	. .	. .	168 27 55.48	+ 3 38.71	− 12.0	. . . .	. .	62 34 59.0	+
	20	B. A. C. 8032	.	. . .	. .	. .	11 23 59.95	+ 4 27.64	+ 12.0	. . . .	. .	62 35 0.8	+
	21	B. A. C. 1536 (R.)	.	. . .	. .	. .	201 17 49.80	+ 4 6.14	+ 23.7	. . . .	. .	29 44 1.6	+2
	22	B. A. C. 1536	.	. . .	. .	. .	338 33 54.82	+ 4 14.04	− 23.7	. . . .	. .	29 44 6.4	+2
	23	β Orionis	9	8 32.68	− 0.61	+ **7.01**	47 7 58.22	+ 5 16.75	+ 1 5.5	5 8 39.14	+ 0.06	98 20 41.7	+
	24	B. A. C. 1650	9	12 58.33	− 0.97	+ 7.07	73 45 56.30	+ 5 20.18	+ 3 26.9	5 13 4.43	− 1.56	125 1 4.6	−
	25	β Tauri	9	18 25.79	− 0.14	+ **7.11**	10 17 52.50	+ 5 19.06	+ 11.1	5 18 32.73	− 0.02	61 29 43.9	+
	26	δ Orionis	9	25 38.34	− 0.52	+ **7.11**	39 11 54.05	+ 4 23.80	+ 49.6	5 25 44.90	− 0.06	90 23 28.6	+
	27	B. A. C. 1781	9	32 8.62	− 1.01	+ 7.09	73 53 56.08	+ 4 41.85	+ 3 38.7	5 32 14.70	− 1.62	125 8 37.8	−
	28	B. A. C. 1825	9	39 22.16	− 1.09	+ 7.10	78 9 59.58	+ 6 43.58	+ 4 45.9	5 39 28.17	− 1.69	129 27 50.3	−
	29	B. A. C. 1842	9	41 16.34	− 1.09	+ 7.10	78 9 59.58	+ 0 47.71	+ 43.6	5 41 22.35	− 1.69	129 21 52.1	−
	30	B. A. C. 1889	9	48 17.18	− 1.05	+ 7.11	76 23 56.30	+ 5 9.00	+ 4 8.3	5 48 23.24	− 1.69	127 39 34.8	−
	31	B. A. C. 1939 (R.)	.	. . .	. .	. .	161 9 59.82	+ 5 11.69	− 20.6	. . . .	. .	69 51 30.3	+
	32	B. A. C. 1939	.	. . .	. .	. .	18 39 57.05	+ 4 52.14	+ 20.6	. . . .	. .	69 51 31.0	+
	33	Piazzi VI, 12	9	3 59.58	− 1.11	+ 7.12	80 51 56.35	+ 3 49.91	+ 6 6.3	6 4 5.59	− 1.78	132 8 13.8	−
	34	δ Ursæ Min., S. P.	5	11 42.64	−11.88	+ 7.13	305 27 54.45	+ 3 21.90	− 1 25.2	18 11 37.89	+ 0.11	356 36 12.4	+
	35	B. A. C. 2098	9	21 46.17	− 1.12	+ 7.14	79 41 57.00	+ 33.38	+ 5 25.3	6 21 52.19	− 1.81	130 54 16.9	−
	36	B. A. C. 2117	9	24 41.94	− 1.12	+ 7.14	79 41 57.00	+ 5 59.36	+ 5 28.1	6 24 47.96	− 1.82	130 59 45.7	−
	37	B. A. C. 2153	9	28 58.04	− 1.07	+ 7.14	77 15 57.15	+ 5 10.46	+ 4 26.2	6 29 4.11	− 1.80	128 31 55.0	−
	38	B. A. C. 2179	9	32 47.07	− 1.06	+ 7.15	76 47 55.90	+ 4 5.03	+ 4 16.4	6 32 53.16	− 1.80	128 2 38.5	−
	39	B. A C. 2195	9	35 41.31	− 1.06	+ 7.15	76 47 55.90	+ 4 10.17	+ 4 16.6	6 35 47.40	− 1.81	128 2 43.9	−
	40	B. A. C. 2225	9	41 54.79	− 1.05	+ 7.16	76 27 54.48	+ 17.79	+ 4 9.3	6 42 0.90	− 1.82	127 38 42.8	−
	41	B. A. C. 2231	5	43 4.75	− 1.05	+ 7.16	76 27 54.48	+ 9 16.47	+ 4 12.0	6 43 10.86	− 1.82	127 47 44.2	−
	42	ε Canis Majoris	9	53 43.04	− 0.90	+ **7.18**	67 35 59.12	+ 3 35.35	+ 2 27.9	6 53 49.31	− 0.06	118 48 23.6	+
	43	δ Canis Majoris	9	3 18.94	− 0.86	+ **7.14**	65 0 1.62	+ 3 23.63	+ 2 10.8	7 3 25.26	− 0.01	116 11 57.2	+
	44	δ^1 Geminorum.	6	12 41.63	− 0.23	+ 7.20	16 35 51.58	+ 5 6.00	+ 18.3	7 12 48.60	− 2.16	67 47 37.1	+
	45	δ^2 Geminorum.	5	12 41.74	− 0 23	+ **7.23**	16 35 51.58	+ 5 0.24	+ 18.3	7 12 48.71	− 0.07	67 47 31.3	+
	46	B. A. C. 2523	9	32 44.68	− 1.01	+ 7.24	73 27 57.35	+ 3 52.20	+ 3 24.5	7 32 50.91	− 1.85	124 41 35.3	−
	47	B. A. C. 2543	5	35 2.95	− 1.07	+ 7.24	76 45 53.30	+ 5 6.43	+ 4 16.9	7 35 9.12	− 1.88	128 1 37.8	−
	48	B. A. C. 2546	5	35 23.19	− 1.07	+ 7.24	76 45 53.30	+ 2 13.10	+ 4 15.9	7 35 29.36	− 1.88	127 58 43.5	−
	49	B. A. C. 2604	9	43 51.94	− 1.12	+ 7.26	79 3 54.00	+ 5 23.09	+ 5 10.5	7 43 58.08	− 1.90	130 20 48.8	−
	50	B. A. C. 2614	9	44 57.76	− 1.12	+ 7.26	79 3 54.00	+ 8 7.97	+ 5 11.8	7 45 3.90	− 1.90	130 23 35.0	−

No.	Barom.	At. Ther.	Ex. Ther.
	in.		°
4	30.22	40.0	35.8
5	30.38	31.2	30.3
10	30.41	34.5	34.2
14	30.41	42.6	45.6
17	30.42	47.3	49.8
20	30.44	52.0	50.0
22	30.46	41.2	38.1
32	30.46	39.8	36.4
42	30.46	37.2	33.8

For summary of the elements of reduction see page 3.

2. Five bisections.
10, 18. Four bisections.
34. Three bisections.
48. One bisection.

ZENITH-POINT CORR.

No. 1 to 4 + 54″.56
No. 5 to 20 + 54.21
No. 21 to 50 + 53.68

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′
12	− 5.1	− 5.8	+ 0.1	− 1
13	− 5.1	+ 5.8	. .	+
14	− 7.4	+ 16 14.7	. .	+ 16
15	− 7.5	− 16 14.7	. .	− 16

TE ID S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST., SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
. 30	1	B. A. C. 2634	9	47 55.04	− 1.12	+ 7.27	79 3 54.00	+ 15.33	+ 5 8.2	7 48 1.19	− 1.90	130 15 38.7	− 1.0
S.	2	B. A. C. 2659	9	53 39.48	− 0.31	+ 7.28	21 9 55.58	+ 4 39.17	+ 23.8	7 53 46.45	− 2.18	72 21 19.8	+ 1.5
	3	Gallia	9	6 56.70	− 0.45	+ 7.30	32 47 55.52	+ 6 51.39	+ 39.6	8 7 3.55	. .	84 1 47.7	− 2.8
	4	B. A. C. 2795	9	13 52.63	− 1.04	+ 7.32	75 1 58.98	+ 4 38.59	+ 3 47.0	8 13 58.91	− 1.87	126 16 45.8	− 0.6
	5	B. A. C. 2820	9	18 39.76	− 1.07	+ 7.33	76 37 57.08	+ 4 53.97	+ 4 14.5	8 18 46.02	− 1.88	127 53 26.7	− 0.5
	6	B. A. C. 2890	9	29 0.03	− 1.08	+ 7.35	77 11 56.75	+ 3 0.78	+ 4 25.4	8 29 6.30	− 1.87	128 25 44.1	− 0.3
	7	B. A. C. 2933	9	34 35.30	− 1.04	+ 7.36	74 55 54.85	+ 4 27.33	+ 3 45.6	8 34 41.62	− 1.86	126 10 29.0	− 0.3
	8	B. A. C. 2974	9	40 3.37	− 1.05	+ 7.37	75 27 55.35	+ 3 54.11	+ 3 54.0	8 40 9.39	− 1.86	126 42 4.7	− 0.2
	9	B. A. C. 3012	9	45 9.41	− 1.09	+ 7.38	77 25 56.82	+ 4 19.14	+ 4 31.1	8 45 15.70	− 1.86	128 41 8.3	− 0.1
	10	B. A. C. 3081	9	55 25.58	− 1.13	+ 7.40	79 29 54.22	+ 4 53 54	+ 5 24.0	8 55 31.85	− 1.86	130 46 33.0	+ 0.3
	11	B. A. C. 3146 (R.)	.	. . .	. . .	. .	143 51 54.72	+ 5 4.01	− 44.7	. . . .	. .	87 10 7.2	− 2.7
	12	B. A. C. 3146	.	. . .	. . .	. .	35 57 53.80	+ 5 7.10	+ 44.7	. . . .	. .	87 10 6.8	− 2.7
	13	α Hydræ	9	21 27.74	− 0.62	+ 7.44	46 55 56.85	+ 4 14.80	+ 1 5.8	9 21 34.56	+ 0.09	98 7 38.6	+ 1.7
	14	B. A. C. 3262	9	26 11.90	− 0.94	+ 7.45	70 5 57.48	+ 4 41.46	+ 2 49.0	9 26 18.41	− 1.78	121 19 49.1	− 0.4
	15	Piazzi IX, 142	9	31 47.63	− 0.96	+ 7.47	70 23 57.55	+ 4 24.48	+ 2 51.8	9 31 54.14	− 1.76	121 37 35 0	− 0.3
	16	ε Leonis	9	38 47.06	− 0.22	+ **7.52**	14 27 51.02	+ 5 14.97	+ 16.0	9 38 54.32	− 0.07	65 39 43.2	+ 1.0
	17	Uranus	9	42 54.77	− 0.36	+ 7.49	24 17 53.60	+ 3 35.29	+ 27.8	9 43 1.90	. .	75 28 17.9	. .
	18	Weisse (2) 1047	9	50 10.66	− 0.32	+ 7.50	21 10 0.98	+ 4 55.45	+ 23.9	9 50 17.84	− 2.17	72 21 41.5	− 6.0
	19	Weisse (2) 1158	9	55 30.93	− 0.33	+ 7.51	21 47 52.72	+ 3 49.18	+ 24.7	9 55 38.11	− 2.14	72 58 27.8	− 6.3
	20	α Leonis	9	1 44.14	− 0.38	+ **7.51**	26 13 53.00	+ 5 19.11	+ 30.4	10 1 51.28	− 0.03	77 26 3.7	+ 2.0
	21	32 Ursæ Maj. (R.)	.	. . .	. . .	. .	206 43 51.60	+ 5 5.59	+ 31.1	. . . .	. .	24 16 52.9	− 1.7
	22	32 Ursæ Majoris	.	. . .	. . .	. .	333 5 55.12	+ 5 8.81	− 31.1	. . . .	. .	24 16 54.0	− 0.6
	23	γ^1 Leonis	8	13 6.31	− 0.28	+ **7.51**	18 19 59.60	+ 5 41.87	+ 20.5	10 13 13.57	+ 0.05	69 32 23.2	+ 3.5
	24	B. A. C. 3652 (R.)	.	. . .	. . .	. .	210 43 51.98	+ 4 50.89	+ 30.7	. . . .	. .	20 17 1.6	−11.8
	25	B. A. C. 3652	.	. . .	. . .	. .	329 5 55.30	+ 5 25.74	− 36.7	. . . .	. .	20 17 5.5	−11.8
	26	Moon II, S.	9	43 15.68	− 0.44	+ 7.60	31 9 57.50	+ 6 25.60	+ 37.4	10 43 22.84	−69.54	82 23 21.7	. .
	27	B. A. C. 3763	9	53 20.51	− 0.99	+ 7.62	71 51 54.72	+ 3 14.71	+ 3 6.7	10 53 27.14	− 1.54	123 4 37.3	− 0.1
	28	δ Leonis (R.)	.	. . .	. . .	. .	162 13 54.70	+ 4 24.87	− 19.6	. . . .	. .	68 48 21.2	+ 0.7
	29	δ Leonis	.	. . .	. . .	. .	17 37 53.78	+ 3,46.77	+ 19.6	. . . .	. .	68 48 21.4	+ 0.9
E.	30	γ Draconis (R.)	.	. . .	. . .	. .	192 31 49.82	+ 4 9.82	+ 13.8	. . . .	. .	38 30 7.8	− 0.2
	31	γ Draconis	.	. . .	. . .	. .	347 19 56.70	+ 4 5.30	− 13.8	. . . .	. .	38 30 9.4	+ 1.4
	32	δ Ursæ Minoris	6	11 20.40	+ 9.63	+ 7.79	312 14 . .	. . .	. .	18 11 37.82	− 0.06	. . . .	. .
	33	α Lyræ	9	32 37.51	+ 0.04	+ **7.84**	0 9 55.00	+ 3 50.36	+ 0.2	18 32 45.34	− 0.02	51 20 6.8	+ 1.1
	34	B. A. C. 6491	9	54 11.88	− 0.06	+ 7.80	6 17 52.28	+ 4 38.01	+ 6.8	18 54 19.62	+ 1.01	57 28 58.3	−16.6
	35	ζ Aquilæ	9	59 37.30	− 0.30	+ **7.75**	25 8 . .	. . .	. .	18 59 44.80	+ 0.16	. . . .	. .
	36	Venus II, S.	9	18 47.93	− 0.72	+ 7.81	60 59 55.32	+ 4 22.43	+ 1 49.4	19 18 55.02	− 0.41	112 12 28.4	. .
	37	Venus N.	.	. . .	. . .	. .	60 59 55.32	+ 4 12.34	+ 1 49.3	. . . .	. .	112 12 18.2	. .
	38	Sun I, S.	9	56 40.61	− 0 62	+ 7.83	56 15 48.12	+ 4 52.30	+ 1 29.4	20 56 47.82	. .	107 28 31.0	. .
	39	Sun II, N.	9	58 57.06	− 0.62	+ 7.83	55 43 49.32	+ 4 23.15	+ 1 27.6	20 59 4.27	. .	106 56 1.3	. .
	40	α Cephei	9	15 26.66	+ 0.80	+ **7.84**	336 45 50.75	+ 4 22.49	− 25.4	21 15 35.30	0.00	27 56 9.0	− 1.4
b. 3	41	γ Geminorum.	9	30 25.30	− 0.28	+ **13 26**	22 17 57.90	+ 5 3.34	+ 24.7	6 30 38.30	− 0.01	73 29 47.1	+ 2.5
S.	42	α Canis Majoris	9	39 32.66	− 0.60	+ **13.29**	55 20 3.15	+ 5 8.77	+ 1 26.9	6 39 45.35	+ 0.05	106 33 0.0	+ 2.2
	43	51 Cephei	7	42 23.13	+10.45	+ 13.29	311 35 55.85	+ 4 34.77	− 1 7.4	6 42 46.87	+ 0.15	2 45 44.4	− 0.5
	44	δ Canis Majoris	9	3 12.66	− 0.72	+ **13.25**	65 0 2.65	+ 3 25.85	+ 2 8.8	7 3 25.26	+ 0.02	116 11 58 5	+ 1.3
	45	δ Geminorum.	9	12 35.56	− 0.23	+ **13.41**	16 35 58.62	+ 4 51.88	+ 18.0	7 12 48.66	− 0.12	67 47 29.7	+ 0.4
	46	B. A. C. 2523	9	32 38.47	− 0.82	+ 13.35	73 28 0.05	+ 3 54.27	+ 3 21.6	7 32 51.00	− 1.84	124 4 37.1	− 2.3
	47	B. A. C. 2543	5	34 56.79	− 0 87	+ 13.36	76 45 59.35	+ 5 3.31	+ 4 13.4	7 35 9.28	− 1.86	128 1 37.3	− 2.4
	48	B. A. C. 2546	5	35 17.07	− 0.87	+ 13.36	76 45 59.35	+ 2 10.24	+ 4 12.4	7 35 29.56	− 1.86	127 58 43.2	− 2.4
	49	B. A. C. 2609 (R.)	.	. . .	. . .	. .	188 53 55.45	+ 5 15.86	+ 9.6	. . . .	. .	42 7 0.3	+ 6.1
	50	B. A. C. 2609	.	. . .	. . .	. .	350 55 56.72	+ 4 54.20	− 9.6	. . . .	. .	42 7 2.5	+ 6.1

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.46	36.5	33.4
30.46	35.3	32.0
30.44	33.8	30.3
30.42	35.0	33.5
30.35	41.6	44.5
30.26	42.6	40.0

For summary of the elements of reduction see page 3.

17. Four bisections.
26. Three bisections.

ZENITH-POINT CORR.

″
No. 1 to 29 + 53.68
No. 30 to 40 + 54.33
No. 41 to 50 + 53.97

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
17	− 0.2	. . .	. .	− 0.2
26	−31 17.8	− 16 33.7	. .	− 47 51.5
36	− 5.1	− 5.1	+ 0.0	− 10.2
37	− 5.1	+ 5 1	. .	0.0
38	− 7.4	− 16 14.8	. .	− 16 22.2
39	− 7.4	+ 16 14.8	. .	+ 16 7.5

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
1877. Feb. 3	1	B. A. C. 2659	9	53 33.38	− 0.27	+ 13.38	21 9 58.95	+ 4 35.25	+ 23.5	7 53 46.49	− 2.19	72 21 18.9	+ 1
S.	2	B. A. C. 2809	9	16 46.50	− 0.89	+ 13.41	77 57 59.45	+ 4 47.87	+ 4 39.6	8 16 59.02	− 1.89	129 13 48.1	− 1
	3	B. A. C. 2820	9	18 33.68	− 0.87	+ 13.41	76 38 0.68	+ 4 50.91	+ 4 11.8	8 18 46.22	− 1.88	127 53 24.6	− 1
	4	B. A. C. 3012	9	45 3.24	− 0.89	+ 13.45	77 26 0.02	+ 4 19.42	+ 4 28.3	8 45 15.80	− 1.88	128 41 8.9	− 1
	5	B. A. C. 3079	9	55 21.78	− 0.20	+ 13.46	13 53 57.02	+ 3 21.63	+ 15.1	8 55 35.04	− 2.42	65 3 54.9	− 2
	6	B. A. C. 3146 (R.)	.	. . .	. .	. .	143 51 59.30	+ 4 58.38	− 44.3	. . . .	. .	87 10 7.8	− 3
	7	B. A. C. 3146	.	. . .	. .	. .	35 57 58.10	+ 5 4.57	+ 44.3	. . . .	. .	87 10 8.2	3
	8	B. A. C. 3192¹	7	15 21.17	− 0.79	+ 13.49	70 2 1.18	+ 3 11.46	+ 2 46.7	9 15 33.87	− 1.83	121 14 20.5	− 1
	9	α Hydræ	9	21 21.64	− 0.53	+ **13.39**	46 55 57.70	+ 4 14.55	+ 1 5.2	9 21 34.60	+ 0.08	98 7 38.6	+ 1
	10	Piazzi IX, 142	9	31 41.43	− 0.79	+ 13.51	70 23 57.42	+ 4 27.14	+ 2 50.1	9 31 54.15	− 1.81	121 37 36.2	− 1
	11	ε Leonis	9	38 41.08	− 0.22	+ **13.56**	14 27 51.78	+ 5 13.87	+ 15.8	0 38 54.37	− 0.08	65 39 42.6	+ 0
	12	Uranus	9	42 8.53	− 0.33	+ 13.52	24 13 55.40	+ 4 5.91	+ 27.5	9 42 21.72	. .	75 24 50.0	.
	13	Lalande 19442	9	49 45.24	− 0.31	+ 13.53	23 29 54.32	+ 4 43.39	+ 26.6	9 49 58.46	− 2.18	74 41 25.5	− 6
	14	α Leonis	9	1 38.12	− 0.33	+ **13.54**	26 13 53.75	+ 5 17.76	+ 30.2	10 1 51.33	− 0.04	77 26 2.9	+ 0
	15	Weisse (2) 234	8	12 45.32	− 0.26	+ 13.56	18 19 53.80	+ 4 18.13	+ 20.3	10 12 58.62	− 2.25	69 30 53.4	− 7
	16	γ¹ Leonis	4	13 0.26	− 0.26	+ **13.61**	18 19 53.80	+ 5 45.02	+ 20.3	10 13 13.56	− 0.03	69 32 20.3	+ 0
5	17	α Lyræ	9	32 28.47	+ 0.02	+ **17.05**	0 10 4.58	+ 3 40.33	+ 0.2	18 32 45.43	− 0.08	51 20 6.3	− 0
F.	18	ζ Aquilæ	9	59 28.22	− 0.33	+ **16 98**	25 7 47.78	+ 4 44.15	+ 28.2	18 59 44.86	+ 0.10	76 19 21.2	+ 2
	19	γ Aquilæ	5	40 7.54	− 0.37	+ **16.94**	28 30 . .	. .	. .	19 40 24.19	+ 0.11	. . . .	.
	20	α Aquilæ	9	44 29.73	− 0.39	+ **16.98**	30 15 48.38	+ 4 46.27	34.8	19 44 46.37	+ 0.09	81 27 30.6	− 0
	21	Venus II, S.	9	50 37.34	− 0.73	+ 17.03	60 3 51.42	+ 4 29.58	+ 1 43.4	19 50 53.64	− 0.40	111 16 25.6	.
	22	Venus, N.	.	. . .	. .	. .	60 3 51.42	+ 4 17.22	+ 1 43.4	. . . .	. .	111 16 13.2	.
6	23	Sun I, S.	9	20 45.82	− 0.63	+ 17.18	54 29 50.88	+ 3 52.16	+ 1 22.7	21 21 2.37	. .	105 41 26.9	.
	24	Sun II, N.	9	23 1.21	− 0.63	+ 17.18	53 57 52.70	+ 3 21.08	+ 1 21.1	21 23 17.76	. .	105 8 56.1	.
	25	α Andromedæ	9	1 44.08	− 0.10	+ **17.32**	10 23 46.95	+ 4 55.66	+ 10.9	0 2 1.30	+ 0.03	61 35 14.7	+ 2
	26	γ Pegasi	8	6 36.79	− 0.28	+ **17 33**	24 17 46.28	+ 5 27.26	+ 26.6	0 6 53.84	+ 0.01	75 30 1.3	+ 3
	27	ι Aurigæ	9	48 43 03	− 0.04	+ **17.61**	5 49 53.62	+ 5 17.96	+ 6.2	4 49 0.58	0.00	57 1 39.0	+ 3
	28	11 Orionis	6	57 16.56	− 0.28	+ **17.59**	23 33 47.40	+ 5 27.34	+ 26.2	4 57 33.88	− 0.07	74 46 2.1	+ 2
	29	Weisse 633	6	26 36.93	− 0.54	+ 17.64	45 23 49.05	+ 3 54.76	+ 1 0.7	5 26 54.03	− 1.46	96 35 5.7	+ 1
	30	Weisse 632	5	26 37.22	− 0.54	+ 17.64	45 23 49.05	+ 4 29.41	+ 1 0.7	5 26 54.32	− 1.46	96 35 40.4	+ 1
	31	B. A. C. 1889	9	48 6.58	− 0.97	+ 17.68	76 23 49.75	+ 5 19.57	+ 4 4.3	5 48 23.29	− 1.58	127 39 34.8	− 4
	32	Taylor 2245	3	51 58.61	− 0.87	+ 17.68	70 45 51.18	+ 4 36.41	+ 2 50.6	5 52 15.42	− 1.56	121 59 39.4	− 3
	33	Piazzi VI, 6	9	2 38.17	− 1.06	+ 17.70	80 59 51.92	+ 4 52.49	+ 6 5.7	6 2 54.81	− 1.67	132 17 11.3	− 5
	34	Piazzi VI, 12	3	3 48.92	− 1.06	+ 17.70	80 51 50.32	+ 4 3.37	+ 6 0.0	6 4 5.56	− 1.67	132 8 14.9	− 5
	35	Piazzi VI, 34	5	6 52.91	− 1.15	+ 17.70	83 55 48.48	+ 4 34.79	+ 8 43.8	6 7 9.46	− 1.71	135 15 28.3	− 5
	36	δ Ursæ Min., S. P.	3	11 32.70	−11.33	+ 17.71	305 28 . .	. .	. .	18 11 39.08	− 0.30	. . . .	.
	37	μ Geminorum	9	15 15.52	− 0.19	+ **17.75**	16 13 45.55	+ 4 58.74	+ 17.5	6 15 33.05	− 0.05	67 25 23.0	+ 0
	38	B. A. C. 2098	9	21 35.40	− 1.03	+ 17.73	79 41 51.55	+ 47.22	+ 5 19.5	6 21 52.10	− 1.71	130 54 19.5	− 4
	39	B. A. C. 2117	9	24 31.42	− 1.03	+ 17.73	79 41 51.55	+ 6 14.21	+ 5 22.2	6 24 48.12	− 1.72	130 59 49.2	− 4
	40	γ Geminorum	9	30 20.86	− 0.27	+ **17 67**	22 17 49.10	+ 5 12.43	+ 24.7	6 30 38.33	+ 0.04	73 29 47.4	+ 2
	41	α Canis Majoris	9	39 28.21	− 0.67	+ **17.79**	55 19 55.35	+ 5 18.26	+ 1 26.8	6 39 45.28	0.00	106 33 1.6	+ 3
	42	B. A. C. 2225	3	41 44.10	− 0.98	+ 17.74	76 27 49.80	+ 29.92	+ 4 4.5	6 42 0.86	− 1.74	127 38 45.4	− 4
	43	B. A. C. 2231	5	42 53.89	− 0.98	+ 17.75	76 27 49.80	+ 9 27.06	+ 4 7.2	6 43 10.66	− 1.74	127 47 45.3	− 4
	44	Lalande 13681	9	58 12.23	− 0.12	+ 17.76	10 25 46.38	+ 5 1.00	+ 11.1	6 58 29.87	− 2.22	61 37 19.7	+ 6
	45	Lalande 13700	9	58 46.30	− 0.12	+ 17.76	10 25 46.38	+ 3 32.82	+ 11.1	6 59 3.94	− 2.23	61 35 51.5	+ 6
	46	Lalande 13724	5	59 26.58	− 0.12	+ 17.76	10 26 . .	. .	. .	6 59 44.22	− 2.23	. . . .	.
	47	Lalande 13757	8	0 21.20	− 0.12	+ 17.76	10 25 46.38	+ 3 39.17	+ 11.1	7 0 38.84	− 2.23	61 35 57.9	+ 6
	48	Durch. 28°, 1331	9	3 43.67	− 0.12	+ 17.76	10 25 46.38	+ 4 7.73	+ 11.1	7 4 1.31	− 2.25	61 36 26.4	+ 6
	49	Lalande 13905	9	4 27.07	− 0.12	+ 17.76	10 25 46.38	+ 2 45.26	+ 11.1	7 4 44.71	− 2.25	61 35 3.9	+ 6
	50	B. A. C. 2477¹	6	23 52.78	− 0.87	+ 17.78	70 21 51.55	+ 4 47.91	+ 2 47.6	7 24 9.69	− 1.79	121 35 48.3	− 3

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.25	39.8	35.8
6	30.27	37.8	33.0
16	30.27	36.5	31.8
18	30.12	40.5	40.0
21	30.13	41.8	41.8
24	30.10	43.7	45.8
26	30.06	48.0	47.6
29	30.04	41.5	38.2

For summary of the elements of reduction see page 3.

5, 6, 7, 16, 45. One bisection.

ZENITH-POINT CORR.

No. 1 to 16 + 53.97″
No. 17 to 26 + 54.80
No. 27 to 50 + 54.98

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
12	− 0.2	. .	. .	− 0.
21	− 5.0	− 6.2	+ 0.0	− 11.
22	− 5.0	+ 6.2	. .	+ 1.
23	− 7.3	− 16 15.4	. .	− 16 22.
24	− 7.2	+ 16 15.4	. .	+ 16 8.

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
. 6	1	B. A. C. 2477²	5	23 53.37	− 0.88	+ 17.78	70 21 51.55	+ 4 42.25	+ 2 47.6	7 24 10.27	− 1.79	121 35 42.6	− 3.0
'.	2	α¹ Geminorum	3	26 29.18	− 0.06	+ 17.78	6 39 50.05	+ 4 16.40	+ 7.1	7 26 46.90	− 2.44	57 50 34.7	+ 5.5
	3	α² Geminorum	3	26 29.76	− 0.06	+ **17.76**	6 39 50.05	+ 4 13.41	+ 7.1	7 26 47.48	+ 0.32	57 50 31.8	+ 0.2
	4	β Geminorum	9	37 31.94	− 0.12	+ **17.81**	10 29 48.40	+ 4 18.14	+ 11.2	7 37 49.62	− 0.03	61 40 38.9	+ 1.3
	5	λ Ursæ Min., S. P.	5	45 59.26	−34.67	+ 17.81	307 45 51.25	+ 5 3.88	− 1 17.2	19 45 42.38	+ 0.71	358 55 59.1	+ 2.3
	6	Gallia	9	1 11.61	− 0.39	+ 17.83	31 17 48.82	+ 5 45.70	+ 36.7	8 1 29.05	. .	82 30 32.4	− 2.6
	7	Anonymous	9	30 36.86	− 0.42	+ 17.87	32 53 51.20	+ 6 56.06	+ 39.1	8 30 54.31	− 2.08	84 7 47.6	− 1.7
	8	ε Hydræ	9	40 0.27	− 0.40	+ **17.93**	31 55 50.45	+ 5 6.13	+ 37.6	8 40 17.75	− 0.10	83 7 55.4	+ 2.1
	9	ι Ursæ Maj. (R.)	.	. . .	. .	. .	189 33 49.50	+ 3 44.58	+ 10.2	. . . .	. .	41 28 36.9	− 0.4
	10	ι Ursæ Majoris	.	. . .	. .	. .	350 17 50.80	+ 4 36.70	− 10.2	. . . .	. .	41 28 38.5	+ 1.2
	11	ε Leonis	9	38 36.72	− 0.19	+ **17.93**	14 27 47.72	+ 5 18.88	+ 15.7	9 38 54.49	0.00	65 39 43.5	+ 1.4
	12	Uranus	9	41 33.66	− 0.31	+ 17.97	24 12 . .	. . .	. .	9 41 51.32	. .	. . . .	. .
	13	Weisse (2) 234	6	12 40.81	− 0.24	+ 18.01	18 20 . .	. . .	. .	10 12 58.58	− 2.30	. . . .	. .
	14	γ¹ Leonis	6	12 55.83	− 0.24	+ **18.07**	18 19 54.12	+ 5 46.87	+ 20.1	10 13 13.60	− 0.04	69 32 22.3	+ 2.3
	15	γ² Leonis	5	12 56.40	− 0.24	+ 18.01	18 19 54.12	+ 5 49.31	+ 20.1	10 13 14.17	− 2.30	69 32 24.7	− 8.0
S.	16	δ Ursæ Minoris	5	11 7.72	+13.01	+ 18.72	312 14 . .	. . .	. .	18 11 39.45	− 0.04	. . . .	. .
	17	α Lyræ	9	32 26.73	+ 0.05	+ **18.79**	0 9 48.70	+ 3 55.51	+ 0.2	18 32 45.52	− 0.02	51 20 5.6	− 1.8
	18	γ Aquilæ	7	40 5.87	− 0.46	+ **18.72**	28 29 51.40	+ 4 35.66	+ 32.6	19 40 24.21	+ 0.11	79 41 20.9	+ 1.8
	19	α Aquilæ	9	44 28.00	− 0.49	+ **18.83**	30 15 49.52	+ 4 45.64	+ 35.0	19 44 46.31	+ 0.01	81 27 31.4	+ 0.5
	20	Venus I, N.	6	55 51.82	− 0.94	+ 18.81	59 51 52.50	+ 4 42.48	+ 1 43.0	19 56 9.69	+ 0.39	111 4 39.2	. .
	21	Venus II, S.	5	55 52.67	− 0.94	+ 18.81	59 51 52.50	+ 4 53.17	+ 1 43.0	19 56 10.54	− 0.46	111 4 49.9	. .
7	22	Sun I, N.	9	24 43.86	− 0.81	+ 18.90	53 37 50.80	+ 4 38.15	+ 1 18.9	21 25 1.95	. .	104 50 9.1	. .
	23	Sun II, S.	9	26 58.81	− 0.81	+ 18.90	54 9 50.05	+ 5 4.68	+ 1 20.5	21 27 16.90	. .	105 22 36.4	. .
	24	α Pegasi	9	58 18.79	− 0.32	+ **18.99**	24 15 50.22	+ 4 49.98	+ 26.0	22 58 37.46	+ 0.02	75 27 27.4	+ 4.9
	25	B. A. C. 1514 (R.)	.	. . .	. .	. .	143 17 48.20	+ 3 37.53	− 43.8	. . . .	. .	87 45 39.3	+ 4.3
	26	B. A. C. 1514	.	. . .	. .	. .	36 33 49.78	+ 4 47.11	+ 43.8	. . . .	. .	87 45 41.9	+ 4.3
	27	β Orionis	9	8 20.09	− 0.76	+ **19.65**	47 7 48.32	+ 5 31.93	+ 1 3.7	5 8 38 98	0.00	98 20 45.1	+ 3.6
	28	B. A. C. 1650	9	12 45.90	− 1.19	+ 19.65	73 45 49.58	+ 5 35.15	+ 3 21.2	5 13 4.36	− 1.42	125 1 7.1	− 5.1
	29	β Tauri	9	18 13.18	− 0.21	+ **19.71**	10 17 47.00	+ 5 26.38	+ 10.8	5 18 32.63	− 0.04	61 29 45.4	+ 2.9
	30	δ Orionis	9	25 25.87	− 0.65	+ **19.63**	39 11 49.35	+ 4 32.67	+ 48.3	5 25 44.89	+ 0.01	90 23 31.5	+ 3.9
	31	B. A. C. 1891	9	48 22.08	− 1.18	+ 19.69	72 35 49.72	+ 4 34.92	+ 3 7.6	5 48 40.59	− 1.54	123 49 53.4	− 4.4
	32	Piazzi VI, 6	9	2 36.17	− 1.08	+ 19.70	80 59 54.48	+ 4 55.11	+ 6 1.9	6 2 54.79	− 1.65	132 17 12.7	− 5.3
	33	δ Ursæ Min., S. P.	5	11 34.78	−14.23	+ 19.71	305 27 46.30	+ 3 25.81	− 1 22 9	18 11 40.26	+ 0.66	356 36 10.4	+ 3.1
	34	B. A. C. 2072	9	18 19.12	− 1.13	+ 19.71	69 37 47.48	+ 6 15.14	+ 2 39.4	6 18 37.70	− 1.63	120 53 3.2	− 3.7
	35	B. A. C. 2122	5	24 50.55	− 1.33	+ 19.71	79 3 50.55	+ 2 24.51	+ 4 59.8	6 25 8.93	− 1.70	130 17 36.1	− 4.7
	36	Brisbane 1256	5	24 56.05	− 1.33	+ 19.71	79 4 . .	. . .	. .	6 25 14.43	− 1.70	. . . .	. .
	37	B. A. C 2135	9	26 24.98	− 1.33	+ 19.72	79 3 50.55	+ 6 38.57	+ 5 1.6	6 26 43.37	− 1.70	130 21 51.9	− 4.7
	38	B. A. C. 2207¹	6	37 49.22	− 1.28	+ 19.72	77 1 51.52	+ 4 24.72	+ 4 14.4	6 38 7.66	− 1.72	128 16 51.8	− 4.4
	39	B. A. C. 2207²	5	37 49.87	− 1.28	+ 19.72	77 1 51.52	+ 4 25.60	+ 4 14.4	6 38 8.31	− 1.72	128 16 52.7	− 4.4
	40	B. A C. 2246	9	44 57.98	− 1.15	+ 19.73	71 7 49.40	+ 5 6.17	+ 2 53.3	6 45 16.56	− 1.71	122 22 10.1	− 3.6
	41	Lalande 13681	9	58 10.38	− 0.20	+ 19.74	10 25 48.75	+ 5 2.09	+ 11.1	6 58 29.92	− 2.22	61 37 23.1	+ 6.8
	42	Lalande 13724	9	59 24.66	− 0.20	+ 19.74	10 25 48.75	+ 5 42.43	+ 11.1	6 59 44.20	− 2.23	61 38 3.5	+ 6.7
	43	Lalande 13757	9	0 19.17	− 0.20	+ 19.74	10 25 48.75	+ 3 39.11	+ 11.0	7 0 38.71	− 2.23	61 36 0.1	+ 6.7
	44	Lalande 13905	9	4 25.12	− 0.20	+ 19.75	10 25 48 75	+ 2 47 00	+ 11.0	7 4 44.67	− 2.25	61 35 8.0	+ 6.4
	45	B. A. C. 2477¹	5	23 50.90	− 1.15	+ 19.76	70 21 49.92	+ 4 52.95	+ 2 46.5	7 24 9.51	− 1.79	121 35 50.6	− 3.3
	46	B. A. C. 2477²	5	23 51.47	− 1.15	+ 19.76	70 21 49.92	+ 4 47.58	+ 2 46.5	7 24 10.08	− 1.79	121 35 45.2	− 3.3
	47	B. A. C. 2545	8	35 6.41	− 1.28	+ 19.77	76 35 49.70	+ 5 10.89	+ 1 7.2	7 35 24.90	− 1.83	127 51 29.0	− 3.5
	48	B. A. C. 2575	9	39 54.80	− 1.28	+ 19.77	76 23 49.20	+ 4 42.59	+ 4 3.5	7 40 13.29	− 1.84	127 38 56.5	− 3.4
	49	Lacaille 2956	5	40 24.83	− 1.28	+ 19.77	76 23 49.20	+ 1 17.53	+ 4 2.5	7 40 43.32	− 1.84	127 35 30.4	− 3.4

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.01	38.4	35.6
29.97	36.5	32.0
29.95	33.8	32.2
29.97	39.7	38.5
29.94	45.9	51.1
29.92	52.3	55.5
30.01	46.2	45.0
30.03	42.2	40.4

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
20	− 4.9	+ 5.4	. .	+ 0.5
21	− 4.9	− 5.4	+ 0.1	− 10.2
22	− 7.2	+ 16 13.6	. .	+ 16 6.4
23	− 7.2	− 16 13.7	. .	− 16 20.9

ZENITH-POINT CORR.

No. 1 to 15 + 54".98
No. 17 to 24 + 54.24
No. 25 to 49 + 55.26

5. Five bisections.
14, 15. One bisection.
33. Three bisections.
35, 41, 42, 43, 48, 49. One bisection.
21. Bar. read at 20h 20m.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Feb. 7	1	B. A. C. 2580	5	40 35.75	− 1.28	+ 19.77	76 23 49.20	+ 6 6.15	+ 4 4.0	7 40 54.24	− 1.84	127 40 20.6	− 3
S.	2	Gallia	9	0 26.04	− 0.53	+ 19.79	31 3 48.62	+ 6 40.61	+ 36.2	8 0 45.30	. .	82 17 26.6	− 2
	3	B. A. C. 2758	9	6 12.46	− 1.26	+ 19.80	75 41 50.98	+ 3 39.82	+ 3 51.7	8 6 31.00	− 1.86	126 55 43.7	− 3
	4	B. A. C. 2794	9	13 19.11	− 1.22	+ 19.80	73 49 51.70	+ 4 31.89	+ 3 24.6	8 13 37.69	− 1.86	125 4 9.4	− 3
	5	Lacaille 3325	9	22 3.11	− 1.14	+ 19.81	70 1 51.40	+ 5 11.08	+ 2 44.3	8 22 21.78	− 1.86	121 16 8.0	− 3
	6	Austria	1	29 36.66	− 0.57	+ 19.81	32 47 45.22	+ 5 36.30	+ 38.7	8 29 55.90	. .	84 0 21.4	− 3
	7	B. A. C. 3079	9	55 15.57	− 0.27	+ 19.83	13 53 48.75	+ 3 31.31	+ 14.9	8 55 35.13	− 2.45	65 3 56.2	− 2
	8	B. A. C. 3146 (R.)	.	. . .	. .	. .	143 51 51.65	+ 5 6.89	− 43.7	. . . .	. .	87 10 6.4	− 3
	9	B. A. C. 3146	.	. . .	. .	. .	35 57 49.48	+ 5 14.73	+ 43.7	. . . .	. .	87 10 9.1	− 3
	10	B. A. C. 3230	9	21 21.20	− 1.34	+ 19.85	78 41 53.78	+ 5 2.87	+ 4 54.9	9 21 39.71	− 1.87	129 58 12.7	− 2
	11	B. A. C. 3257	9	25 34.70	− 1.34	+ 19.86	78 41 53.78	+ 2 37.46	+ 4 53.9	9 25 53.22	− 1.87	129 55 46.3	− 2
	12	ε Leonis	9	38 34.84	− 0.28	+ 19.91	14 27 48.12	+ 5 18.96	+ 15.6	9 38 54.43	− 0.07	65 39 43.9	+ 1
	13	Atala.	8	43 32.10	− 0.12	+ 19.87	5 57 47.68	+ 6 10.7	+ 6.4	9 43 51.85	. .	57 10 25.4	− 0
	14	Lalande 19442	9	49 39.00	− 0.42	+ 19.88	23 29 51.00	+ 4 48.75	+ 26.3	9 49 58.46	− 2.24	74 41 27.3	− 6
	15	α Leonis	9	1 32.02	− 0.46	+ 19.83	26 13 47.30	+ 5 25.87	+ 29.8	10 1 51.45	+ 0.02	77 26 4.2	+ 2
	16	32 Ursæ Maj. (R.)	.	. . .	. .	. .	206 43 46.95	+ 5 14.47	+ 30.4	. . . .	. .	24 16 49.4	− 3
	17	32 Ursæ Majoris	.	. . .	. .	. .	333 5 48.40	+ 5 13.83	− 30.4	. . . .	. .	24 16 53.0	+ 0
	18	γ^1 Leonis	8	12 54.10	− 0.34	+ 19.92	18 19 52.28	+ 5 48.64	+ 20.1	10 13 13.66	0.00	69 32 22.2	+ 2
	19	Weisse 361	9	21 39.71	− 0.47	+ 19.90	26 41 48.22	+ 4 25.82	+ 5 4.0	10 21 59.14	− 2.13	77 57 39.2	− 8
	20	Polaris, S. P.	3	13 11.87	−35.09	+ 20.02	307 30 . .	. . .	. .	1 12 56.80	− 0.08	. . . .	.
	21	B. A. C. 4870	9	38 39.12	0.00	+ 20.08	357 49 48.88	+ 5 28.92	− 2.2	14 38 59.20	− 1.18	49 1 36.8	−26
	22	B. A. C. 4963	.	. . .	. .	. .	352 11 48.32	+ 4 40.46	− 8.2	. . . .	. .	43 22 41.8	−27
	23	β Bootis	.	. . .	. .	. .	357 55 47.18	+ 5 45.09	− 2.1	. . . .	. .	49 7 51.4	+ 0
	24	B. A. C. 4967	.	. . .	. .	. .	338 7 49.10	+ 5 26.50	− 24.2	. . . .	. .	29 19 12.3	−29
	25	B. A. C. 5017	7	7 40 86	− 1.40	+ 20.10	79 45 50.38	+ 4 20.39	+ 5 27.8	15 7 59.56	− 0.60	131 1 59.8	− 1
	26	B. A. C. 5035	3	10 34.75	− 1.38	+ 20.10	79 1 52.88	+ 6 45.34	+ 5 7.6	15 10 53.47	− 0.59	130 20 7.0	− 1
	27	B. A. C. 5046	5	13 0.17	− 1.37	+ 20.10	79 1 52.88	− 1 15.17	+ 5 3.9	15 13 18.90	− 0.58	130 12 2.8	− 1
	28	Lacaille 6328	6	13 12.79	− 1.37	+ 20.10	79 1 52.88	+ 4 51.60	+ 5 6.7	15 13 31.52	− 0.58	130 18 12.4	− 1
	29	μ^1 Bootis	3	19 31.44	+ 0.02	+ 19.96	0 59 50.80	+ 5 39.13	+ 1.2	15 19 51.56	+ 0.10	52 11 52.3	+ 0
	30	B. A. C. 5135^1	6	28 36.68	− 0.48	+ 20.11	27 51 53.15	+ 4 34.14	+ 32.2	15 28 56.31	− 0.64	79 3 20.7	−19
	31	B. A. C. 5135^2	4	28 36.77	− 0.48	+ 20.11	27 51 53.15	+ 4 31.08	+ 32.2	15 28 56.40	− 0.64	79 3 17.6	−19
	32	B. A. C. 5216 (R.)	.	. . .	. .	. .	156 51 48.95	+ 3 4.66	− 25.9	. . . .	. .	74 11 53.5	−21
	33	B. A. C. 5216	.	. . .	. .	. .	22 59 51.10	+ 5 14.37	+ 25.9	. . . .	. .	74 11 52.6	−21
	34	δ Scorpii	9	52 45.06	− 0.99	+ 20.15	61 3 51.62	+ 4 18.31	+ 1 49.7	15 53 4.20	+ 0.01	112 16 20.8	+ 2
	35	β^1 Scorpii	6	57 58.37	− 0 94	+ 20.25	58 15 49.42	+ 4 22.57	+ 1 38.1	15 58 17.56	− 0.06	109 28 11.3	+ 0
	36	β^2 Scorpii	5	57 58.85	− 0.94	+ 20.13	58 15 49.42	+ 4 9.49	+ 1 38.1	15 58 18.04	− 0.44	109 27 58.2	− 9
	37	δ Ophiuchi	9	7 35.04	− 0.68	+ 20.10	42 9 54.45	+ 5 38.66	+ 55.1	16 7 54.50	+ 0.06	93 22 49.4	+ 1
	38	α Scorpii	7	21 33.25	− 1.06	+ 20.19	64 55 51.72	+ 5 10.80	+ 2 9.7	16 21 52.34	− 0.06	116 9 33.4	+ 0
	39	ζ Ophiuchi	9	30 4.15	− 0.79	+ 20.15	49 7 53.58	+ 3 47.45	+ 1 10.3	16 30 23.51	0.00	100 19 12.5	+ 2
	40	B. A. C. 5643 (R.)	.	. . .	. .	. .	198 1 48.10	+ 3 53.81	+ 19.9	. . . .	. .	33 0 19.4	−28
	41	B. A. C. 5643	.	. . .	. .	. .	341 49 52.10	+ 4 27.56	− 19.9	. . . .	. .	33 0 21.0	−28
	42	B. A. C. 5781	6	3 0.39	− 0.89	+ 20.17	54 21 49.95	+ 4 49.44	+ 1 24.8	17 3 19.67	− 0.14	105 34 25.4	−11
	43	α^1 Herculis.	9	8 42.56	− 0.43	+ 20.26	24 15 50.25	+ 5 46.69	+ 27.5	17 9 2.31	− 0.06	75 28 25.6	+ 1
	44	β Draconis (R.)	.	. . .	. .	. .	193 25 46.92	+ 3 27.97	+ 14.6	. . . .	. .	37 36 51.7	+ 0
	45	β Draconis	.	. . .	. .	. .	346 25 50.70	+ 4 55.04	− 14.6	. . . .	. .	37 36 52 3	+ 1
	46	μ Herculis.	9	41 18.23	− 0.20	+ 20.40	11 1 49.32	+ 4 22.18	+ 11.9	17 41 38.23	− 0.16	62 12 44.6	+ 1
	47	Moon II.	9	51 26.04	− 1.12	+ 20.21	68 0 . .	. . .	. .	17 51 45.13	−70.13	. . . .	.
	48	δ Ursæ Minoris	6	11 7.38	+12.74	+ 20 23	312 13 47.00	+ 4 50.69	− 1 6.3	18 11 40.35	+ 0.65	3 23 52.6	− 0
P.	49	δ Ursæ Minoris	5	11 7.34	+12.66	+ 20.17	312 13 46.52	+ 4 50.94	− 1 6.3	18 11 40.17	+ 0.47	3 23 52.4	− 0
	50	α Lyræ.	9	32 25.43	0.00	+ 20.16	0 9 49.98	+ 3 55.76	+ 0.2	18 32 45.61	+ 0.05	51 20 7.1	− 0

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
7	30.03	39.5	36.2
19	30.03	37.9	34.3
22	30.04	34.0	31.0
34	30.05	34.0	31.1
39	30.07	33.6	31.1
44	30.08	33.6	31.2
49	30.10	35.3	34.2

For summary of the elements of reduction see page 3.

1, 6. One bisection.
49. Three bisections.
50. Four bisections.

ZENITH-POINT CORR.

No. 1 to 48 + 55″.26
No. 49 to 50 + 55.41

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″

TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
c. 7	1	51 Cephei, s. p.	7	42 41.59	−15.59	+ 20.19	306 3 49.98	+ 5 27.03	− 1 22.1	6 42 46.19	+ 0.41	357 14 16.1	− 0.1
P.	2	β Lyræ	6	45 11.45	− 0.10	+ **20.21**	5 35 48.85	+ 4 46.30	+ 6.0	18 45 31.54	+ 0.02	56 47 2.4	− 1.2
	3	ζ Aquilæ	9	59 25.09	− 0.42	+ **20.25**	25 7 49.30	+ 4 41.68	+ 28.2	18 59 44.87	+ 0.06	76 19 20.4	+ 0.9
	4	B. A. C. 2326, s. p.	6	5 4 17	− 6.22	+ 20.20	301 29 52.02	+ 4 12.55	− 1 37.3	7 5 18.15	−13.05	351 38 48.5	−16.3
	5	δ Draconis	5	12 6.65	+ 1.18	+ 20.21	331 23 52.88	+ 3 54.63	− 32.6	19 12 28.04	+ 0.08	22 33 36.1	0.0
	6	τ Draconis	4	17 27.60	+ 1.82	+ 20.21	325 41 48.30	+ 5 13.13	− 40.7	19 17 49.63	− 0.02	16 52 41.9	− 0.4
	7	B. A. C. 6734 (R.)	.	. . . .	. .	. .	190 57 47.22	+ 4 18.81	+ 11.7	. . . .	. .	40 4 3.5	−16.3
	8	B. A. C. 6734	3	32 46.32	+ 0.28	+ 20.22	348 53 55.38	+ 3 59.70	− 11.7	19 33 6.82	+ 1.73	40 4 4.6	−16.3
	9	β Aquilæ	9	48 56.06	− 0.52	+ **20.19**	32 41 54.75	+ 5 15.21	+ 38.5	19 49 15.77	+ 0.08	83 54 9.7	+ 1.1
	10	Venus II, C.	9	1 7.56	− 0.89	+ 20.24	59 39 52.25	+ 4 35.00	+ 1 42.0	20 1 26.91	− 0.40	110 52 30.4	. .
	11	γ Cygni	9	17 27.21	+ 0.02	+ 20.25	358 57 48.82	+ 4 13.32	− 1.0	20 17 47.48	+ 1.41	50 8 22.3	−12.2
	12	α Cygni (R.)	.	. . . .	. .	. .	185 51 47.68	+ 4 47.33	+ 6.2	. . . .	. .	45 9 40.0	− 0.6
	13	α Cygni	3	36 52.28	+ 0.14	+ 20.26	353 57 54.10	+ 5 32.33	− 6.2	20 37 12.68	+ 0.04	45 9 41.4	+ 0.8
	14	α Cephei (R.)	.	. . . .	. .	. .	203 5 51.65	+ 3 54.78	+ 25.4	. . . .	. .	27 56 9.4	− 3.5
	15	α Cephei	2	15 14.14	+ 0.82	+ 20.29	336 45 53.02	+ 4 23.63	− 25.4	21 15 35.25	− 0.06	27 56 12.5	− 0.4
8	16	Sun I, S.	3	28 41.49	− 0.79	+ 20.30	53 51 51.88	+ 3 58.47	+ 1 21.3	21 29 1.00	. .	105 3 32.9	. .
	17	Sun II, N.	9	30 55.99	− 0.79	+ 20.30	53 19 53.45	+ 3 52.05	+ 1 19.8	21 31 15.50	. .	104 31 6.5	. .
	18	B. A. C. 7851	2	21 56.65	+ 9.02	+ 20.33	313 20 . .	. .	. .	22 22 26.00	+22.40	. . . .	. .
	19	ι Cephei	3	44 53.41	+ 1.10	+ 20.35	333 15 52.82	+ 4 56 46	− 29.6	22 45 14.86	+ 0.21	24 26 40.9	+ 0.2
	20	α Piscis Aust.	9	50 31.51	− 1.02	+ **20.31**	69 4 . .	. .	. .	22 50 50.85	+ 0.06	. . . .	. .
	21	ι Piscium	8	33 17.20	− 0.50	+ **20.39**	33 49 55.68	+ 5 33.15	+ 39.6	23 33 37.08	− 0.04	85 2 29.6	+ 3.9
	22	ω Piscium	9	52 39.47	− 0.48	+ **20.45**	32 37 48.02	+ 4 18.01	+ 37.8	23 52 59.38	− 0.06	83 49 5.0	+ 1.9
	23	α Andromedæ (R.)	.	. . . .	. .	. .	169 27 50.65	+ 3 28.56	− 10.9	. . . .	. .	61 35 12.9	0.0
	24	α Andromedæ	.	. . . .	. .	. .	10 23 51.32	+ 4 51.36	+ 10.9	. . . .	. .	61 35 14.8	+ 1.9
	25	γ Pegasi	9	6 33.76	− 0.37	+ **20.44**	24 17 52.32	+ 5 21.38	+ 26.7	0 6 53.70	− 0.03	75 30 1.6	+ 3.6
	26	β Ceti	9	37 5.38	− 0.82	+ **20.40**	57 27 54.58	+ 4 1.73	+ 1 32.3	0 37 24.98	+ 0.08	108 39 49.8	+ 2.3
	27	B. A. C. 262.	7	51 30.02	+ 9.45	+ 20.43	313 13 51.28	+ 4 42.83	− 1 2.5	0 51 59.90	+15.43	4 23 52.8	+22.1
	28	ε Piscium	9	56 13.64	− 0.46	+ **20.40**	31 33 53.60	+ 5 29.10	+ 36.3	0 56 33.62	+ 0.03	82 46 20.2	+ 2.2
	29	β Andromedæ	.	. . . .	. .	. .	3 51 50.90	+ 3 29.61	+ 4.0	. . . .	. .	55 1 45.7	+11.3
	30	Polaris	4	12 3.85	+32.31	+ 20.45	310 9 52.28	+ 5 22.19	− 1 9 6	1 12 56.61	+ 0.10	1 20 26.1	+ 2.1
	31	ε Ursæ Min., s. p.	.	. . . .	. .	. .	301 5 53.55	+ 3 11.39	− 1 39.4	. . . .	. .	352 13 46.7	+ 2.3
	32	β Orionis	6	8 18.87	− 0.69	+ **20.79**	47 7 57.52	+ 5 19.19	+ 1 5.0	5 8 38.95	− 0.02	98 20 42.9	+ 1.3
	33	B. A. C. 1650	9	12 44.74	− 1.13	+ 20.77	73 45 52.52	+ 5 27.82	+ 3 25.2	5 13 4.38	− 1.40	125 1 6.7	− 5.2
	34	β Tauri	3	18 12.03	− 0.16	+ **20.80**	10 17 49.42	+ 5 21.82	+ 11.0	5 18 32.65	− 0.01	61 29 43.4	+ 0.9
	35	δ Orionis	9	25 24.66	− 0.59	+ **20.77**	39 11 52.70	+ 4 25.35	+ 49 2	5 25 44.86	− 0.01	90 23 28.4	+ 0.7
	36	ω Draconis, s. p.	.	. . . .	. .	. .	287 41 49.60	+ 3 22.68	− 3 6.1	. . . .	. .	338 48 27.4	+ 2.8
	37	α Orionis (R.)	.	. . . .	. .	. .	148 25 53.78	+ 4 5.40	− 36.9	. . . .	. .	82 36 58.9	+ 0.6
	38	α Orionis	.	. . . .	. .	. .	31 25 53.08	+ 4 8.41	+ 36.9	. . . .	. .	82 36 59.6	+ 1.3
	39	ν Orionis	9	0 14.14	− 0.39	+ 20.86	24 1 53.35	+ 4 21.38	+ 27.0	6 0 34.61	− 1.72	75 13 2.9	+ 6.4
	40	22 Camelop.	9	4 59.37	+ 1.40	+ 20.86	329 27 48.95	+ 4 32.26	− 35.4	6 5 21.63	+ 0.32	20 38 7.0	+ 1.2
	41	δ Ursæ Min., s. p.	4	11 31.32	−12.99	− 20.87	305 27 50.95	+ 3 20.49	− 1 24.3	18 11 39.20	− 0.61	356 36 8.3	+ 1.2
	42	γ Geminorum (R.)	.	. . . .	. .	. .	157 31 50.68	+ 5 8.76	− 24.8	. . . .	. .	73 29 46.6	+ 1.9
	43	γ Geminorum	2	30 17.58	− 0.36	+ 20.90	22 17 51.40	+ 5 8.83	+ 24.8	6 30 38.12	− 0.18	73 29 46.2	+ 1.5
	44	51 Cephei (R.)	.	. . . .	. .	. .	228 13 51.48	+ 5 39.63	+ 1 7.7	. . . .	. .	2 45 42.4	− 1.3
	45	51 Cephei	5	42 10.44	+14.74	+ 20.91	311 35 51.52	+ 4 39.40	− 1 7.7	6 42 46.09	+ 0.40	2 45 44.4	+ 0.7
	46	B. A. C. 2326	3	4 52.00	+ 5.17	+ 20.94	316 11 50.28	+ 4 0.34	− 57.8	7 5 18.11	−13.01	7 21 14.0	+16.4
	47	B. A. C. 2439 (R.)	.	. . . .	. .	. .	209 43 52.10	+ 4 58.83	+ 34.6	. . . .	. .	21 16 55.7	+13.1
	48	B. A. C. 2439	3	17 46.48	+ 1.34	+ 20.96	330 7 50.78	+ 3 21.45	− 34.6	7 18 8.78	− 5.15	21 16 58.8	+13.1
	49	Piazzi VII, 137	9	25 37.44	− 1.05	+ 20.96	69 29 55.30	+ 3 24.97	+ 2 40.9	7 25 57.35	− 1.78	120 42 22.4	− 3.4
	50	B. A. C. 2502	9	29 6.07	− 1.16	+ 20.97	74 53 54.62	+ 28.78	+ 3 40.8	7 29 25.88	− 1.80	116 4 25.4	− 3.8

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.09	37.3	36.9
30.10	39.0	38.6
30.11	40.3	40.0
30.11	40.4	40.4
30.10	41.0	41.3
30.09	42.5	42.5
30.06	47.3	45.5
30.05	45.8	45.5
30.04	45.7	45.4
30.04	45.4	45.2
30.05	45.2	45.0
30.07	37.4	35.0
30.06	37.8	35.4
30.06	36.4	33.5

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR. ″
No. 1 to 30 + 55.41
No. 31 to 50 + 55.01

1, 5, 27, 31, 36, 40, 41. Three bisections.
3, 11, 25, 28, 29, 34, 39. Four bisections.
7, 8, 49, 50. One bisection.
30. Five bisections.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
10	− 5.0	. .	+ 0.1	− 4.9
16	− 7.2	− 16 13.2	. .	− 16 20.4
17	− 7.2	+ 16 13.2	. .	+ 16 6.0

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Feb. 8	1	B. A. C. 2536 .	9	33 58.47	− 1.17	+ 20.97	74 53 54.62	+ 9 8.11	+ 3 43.0	7 34 18.27	− 1.81	126 13 6.9	−
P.	2	B. A. C. 2609 (R)	.	. . .	. .	. .	188 53 52.28	+ 5 19.14	+ 9.6	. . . .	. .	42 7 0.2	+
	3	B. A. C. 2609 .	3	45 26.81	+ 0.25	+ 20 99	350 55 50.92	+ 4 58.92	− 9.6	7 45 48.05	− 3.14	42 7 1.4	+
	4	λ Ursæ Min., S. P.	3	46 2.40	−39.86	+ 20.99	307 45 51.32	+ 5 3.24	− 1 17.7	19 45 43.53	+ 1.31	358 55 58.1	+
	5	B. A. C. 2677 .	9	0 22.24	+ 5.28	+ 21.01	316 1 50.65	+ 4 15.06	− 58.2	8 0 48.53	−15.13	7 11 28.7	+1
	6	B. A. C. 2775 .	9	9 1.17	− 1.08	+ 21.02	70 31 55.32	+ 5 4.24	+ 2 50.6	8 7 21.11	− 1.84	121 46 11.4	−
	7	B. A. C. 2809 .	9	16 39.30	− 1.23	+ 21.03	77 57 54.78	+ 4 58.05	+ 4 39.5	8 16 59.10	− 1.88	129 13 53.5	−
	8	η Cancri . . .	9	25 17.24	− 0.30	+ 21.04	17 57 51.80	+ 1 1.54	+ 19.7	8 25 37.98	− 2.33	69 8 34.2	−
	9	B. A. C. 2933 .	9	34 21.70	− 1.18	+ 21.05	74 55 55.02	+ 4 33.92	+ 3 42.9	8 34 41.57	− 1.87	126 10 33.0	−
	10	B. A. C. 2974 .	9	39 49 79	− 1.19	+ 21.06	75 27 53.20	+ 4 2.65	+ 3 51.1	8 40 9.66	− 1.88	126 42 8.1	−
	11	B. A. C. 3030 .	9	47 48.34	− 1.22	+ 21.07	76 59 54.95	+ 5 8.67	+ 4 19.0	8 48 8.19	− 1.88	128 15 43.8	−
	12	σ² Ursæ Majoris .	9	59 16.08	+ 1.21	+ 21.08	331 11 49.60	+ 4 28.25	− 33.2	8 59 38.37	− 0.13	22 22 5.8	+
E.	13	α Cygni . . .	8	36 50.48	+ 0.30	+ **21.91**	353 57 42.80	+ 5 43.84	− 6.2	. . . .	. .	45 9 41.6	+
9	14	Sun I, N. . .	5	32 37.59	− 0.79	+ 21.99	52 59 51.70	+ 4 16.32	+ 1 19.2	21 32 58.79	. .	104 11 48.4	
	15	Sun II, S. . .	9	34 52.23	− 0.79	+ 21.99	53 31 49.45	+ 4 45.55	+ 1 20.7	21 35 13.43	. .	104 44 16.9	
	16	ζ Pegasi . . .	4	34 57.57	− 0.44	+ **21.94**	28 38 . .	. .	. .	22 35 19.21	+ 0.23	. . . .	
	17	α Piscis Aust. .	8	50 29.60	− 1.10	+ **22.30**	69 4 . .	. .	. .	22 50 50.59	− 0.20	. . . .	
	18	α Pegasi . . .	9	58 15.74	− 0.37	+ **22 09**	24 15 48.65	+ 4 49.76	+ 27.0	22 58 37.47	+ 0.03	75 27 26.6	+
	19	α Andromedæ .	9	1 39.17	− 0.15	+ **22 25**	10 23 44.25	+ 4 58.27	+ 11.0	0 2 1.22	- 0.02	61 35 14.7	+
	20	γ Pegasi . . .	9	6 32.01	− 0.38	+ **22.19**	24 17 50.42	+ 5 23.26	+ 27.0	0 6 53.84	+ 0.03	75 30 1.9	+
	21	β Ceti	9	37 3.64	− 0.89	+ **22.20**	57 27 48.80	+ 4 6.90	+ 1 33.2	0 37 25.00	+ 0.11	108 39 50.1	+
	22	Polaris . . .	5	11 59.02	+34.90	+ 22.30	310 9 48.65	+ 5 23.98	− 1 10.1	1 12 56.22	+ 0.50	1 20 23.7	−
	23	β Orionis . . .	9	8 17.07	− 0.74	+ **22.63**	47 7 44.72	+ 5 33.16	+ 1 5.2	5 8 38.99	+ 0.03	98 20 44.3	+
	24	β Tauri . . .	9	18 10.09	− 0.16	+ **22.73**	10 17 43.50	+ 5 28.65	+ 11.1	5 18 32.60	− 0.05	61 29 44.5	+
	25	δ Orionis . . .	9	25 22.82	− 0.63	+ **22.64**	39 11 47.80	+ 4 30.84	+ 49 4	5 25 44.87	+ 0.01	90 23 29.2	+
	26	ι Orionis . . .	9	29 4.48	− 0.72	+ 22.68	44 51 48.98	+ 22.35	+ 1 0.2	5 29 26.44	− 1.43	95 59 32.7	+
	27	B. A. C. 1825 .	9	39 6.63	− 1.34	+ 22.69	78 9 51.15	+ 6 55.49	+ 4 44.5	5 39 27.98	− 1.51	129 27 52.3	−
	28	B. A. C. 1842 .	9	41 0.70	− 1.34	+ 22.69	78 9 51.15	+ 59.25	+ 4 42.3	5 41 22.05	− 1.51	129 21 53.9	−
	29	α Orionis (R.) .	.	. . .	. .	. .	148 25 46.95	+ 4 12.26	− 37.1	. . . .	. .	82 36 59.1	+
	30	α Orionis . . .	.	. . .	. .	. .	31 25 48.50	+ 4 13.90	+ 37.1	. . . .	. .	82 37 0.7	+
	31	22 Camelop. . .	9	4 57.32	+ 1.58	+ 22.71	329 27 46.15	+ 4 36.62	− 35.7	6 5 21.61	+ 0.33	20 38 8.3	+
	32	δ Ursæ Min., S. P.	9	11 31.77	−14.48	+ 22.72	305 27 48.42	+ 3 24.60	− 1 24.9	18 11 40.01	− 0.02	356 36 9.3	+
	33	O. Arg. N. 6808.	9	18 48.43	+ 2.77	+ 22.72	319 7 48.22	+ 5 9.96	− 52.3	6 19 13.92	− 7.98	10 18 27.1	+2
	34	23 (H.) Camelop. .	9	24 54.16	+ 3.92	+ 22.73	310 7 48.22	+ 4 54.25	− 52.3	6 25 20.81	− 8.19	10 18 11.4	+2
	35	51 Ceti	9	42 6.30	+16.37	+ 22.75	311 35 48.25	+ 4 43.81	− 1 8.3	6 42 45.42	− 0.08	2 45 45.0	+
	36	50 Draconis, S. P. .	9	49 55.77	− 3.69	+ 22.75	294 7 48.42	+ 5 3.91	− 2 14.4	18 50 14.83	+ 0.05	345 16 59.1	+
	37	Lalande 13681 .	8	58 7.28	− 0.17	+ 22.76	10 25 49.38	+ 5 1.40	+ 11.3	6 58 29.87	− 2.21	61 37 23.3	+ 6
	38	Lalande 13700	5	58 41.35	− 0.17	+ 22.76	10 25 49.38	+ 3 31.06	+ 11.3	6 59 3.94	− 2.21	61 35 52.9	+ 6
	39	Lalande 13724 .	8	59 21.55	− 0.17	+ 22.76	10 25 49.38	+ 5 40.84	+ 11.3	6 59 44.14	− 2.21	61 38 2.7	+ 6
	40	Lalande 13757 .	8	0 16.10	− 0.17	+ 22.77	10 25 49.38	+ 3 39.44	+ 11.3	7 0 38 70	− 2.22	61 36 1.3	+ 6
	41	D. M. 28°. 1331.	8	3 38.62	− 0.17	+ 22.77	10 25 49.38	+ 4 7.88	+ 11.3	7 4 1.22	− 2.24	61 36 29.8	+ 6
	42	Lalande 13905 .	9	4 22.00	− 0.17	+ 22.77	10 25 49.38	+ 2 44.66	+ 11.3	7 4 44.60	− 2.24	61 35 6.5	+ 6
	43	B. A. C. 2439 (R.)	.	. . .	. .	. .	209 43 48.90	+ 5 3.27	+ 34.8	. . . .	. .	21 16 54.2	+13
	44	B. A. C. 2439 .	5	17 44.62	+ 1.50	+ 22.78	330 7 49.88	+ 3 23.81	− 34.8	7 18 8.90	− 5.14	21 17 0.1	+13
	45	α Canis Min., (R.).	.	. . .	. .	. .	146 33 48.42	+ 5 32.66	− 40.0	. . . .	. .	84 27 40.1	− 0
	46	α Canis Minoris .	.	. . .	. .	. .	33 15 43.85	+ 4 54.91	+ 40.0	. . . .	. .	84 27 40.0	− 0
	47	B. A. C. 2609 (R.)	.	. . .	. .	. .	188 53 47.65	+ 5 21.13	+ 9.6	. . . .	. .	42 7 2.8	+ 7
	48	B. A. C. 2609 .	3	45 25.11	+ 0.30	+ 22.81	350 55 46.15	+ 5 3.32	− 9.6	7 45 48.22	− 3.14	42 7 1.1	+ 7
	49	Groom. 3241, S. P.	9	30 7.07	− 3.09	+ 22.85	290 57 46.62	+ 5 14.07	− 2 37.4	20 30 26.83	+ 0.65	342 6 44.5	+ 0
	50	ε Hydræ . . .	9	39 55.49	− 0.53	+ **22.85**	31 55 51.22	+ 5 4.77	+ 38.2	8 40 17.82	− 0.04	83 7 55.4	+

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
8	30.06	35.0	32.0
9	30.06	35.0	32.0
13	30.13	38.8	39.0
15	30.11	40 0	40.8
22	30.18	44.0	43.5
23	30.14	38.0	35.0

For summary of the elements of reduction see page 3.

5, 12, 22, 32, 35. Three bisections.
37, 38, 39, 40, 41. One bisection.

ZENITH-POINT CORR.

No. 1 to 12 + 55.″01
No. 13 to 22 + 55.32
No. 23 to 50 + 55.87

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
14	− 7.1	+ 16 14.2	. .	+ 16 7
15	− 7.2	− 16 14.2	. .	− 16 21
			. .	

TE D R.	Number.		OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
17-					m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
9	1		O. Arg. N. 9450.	9	49 36.37	+ 0.31	+ 22.87	350 17 49.00	+ 4 42.48	− 10.4	8 49 59.55	− 3.41	41 28 42.3	+ 0.7
	2	ι	Ursæ Majoris .	9	50 26.92	+ 0.30	+ 22.87	350 17 49.00	+ 4 38.11	− 10.4	8 50 50.09	− 0.03	41 28 37.9	+ 1.1
	3		B. A. C. 3079 .	9	55 12.46	− 0.25	+ 22.87	13 53 47.80	+ 3 30.28	+ 15.2	8 55 35.08	− 2.47	65 3 54.5	− 2.1
	4	κ	Cancri . . .	9	0 44.84	− 0.47	+ **22.88**	27 39 52.22	+ 3 36.57	+ 32.1	9 1 7.25	+ 0.03	78 50 22.1	+ 3.1
	5	α	Hydræ . . .	9	21 12.41	− 0.76	+ **22.90**	46 55 47.80	+ 4 24.90	+ 1 5.5	9 21 34.54	− 0.03	98 7 39.4	+ 0.7
	6	β	Lyræ . . .	9	45 8.14	− 0.15	+ **23.62**	5 35 52.80	+ 4 41.89	+ 6.1	18 45 31.60	+ 0.03	56 47 2.0	− 2.0
	7	δ	Draconis . .	9	12 3.02	+ 1.28	+ 23.63	331 23 51 62	+ 3 53.95	− 33.1	19 12 27.93	− 0.09	22 33 33.7	− 3.0
	8	γ	Aquilæ . . .	9	40 1.09	− 0.54	+ **23 64**	28 29 54.02	+ 4 30.54	+ 33.0	19 40 24.20	+ 0.04	79 41 18.8	− 0.7
	9	α	Aquilæ . . .	9	44 23.32	− 0.56	+ **23.64**	30 15 52.50	+ 4 41.28	+ 35.4	19 44 46.41	+ 0.05	81 27 30.4	− 0.8
	10		B. A. C. 6934 .	9	4 34.11	− 0.70	+ 23 66	39 59 55.65	+ 4 7.60	+ 50.8	20 4 57.07	+ 0.46	91 11 15.2	−11.3
	11		Venus II, N. .	9	11 34.08	− 1.00	+ 23.67	59 13 49.78	+ 4 7.00	+ 1 41.4	20 11 56.75	− 0.39	110 25 59.4	. .
	12		Venus, S. . .	.	. . .	. .	. .	59 13 49.78	+ 4 18.89	+ 1 41.4	. . . . .	. .	110 26 11.3	. .
	13	γ	Cygni . . .	3	17 23.87	+ 0.02	+ 23.67	358 57 49.55	+ 4 12.35	− 1.0	20 17 47.56	+ 1.38	50 8 22.1	−12.7
10	14		Sun I, S. . .	9	36 33.49	− 0.88	+ 23.73	53 11 55.38	+ 5 4.70	+ 1 20.1	21 36 56.34	. .	104 24 41.4	. .
	15		Sun II, N. . .	9	38 47.77	− 0.88	+ 23.73	52 39 57.48	+ 4 39.78	+ 1 18.5	21 39 10.62	. .	103 52 17.0	. .
	16	ζ	Pegasi . . .	3	34 55.81	− 0.51	+ **23.77**	28 38 . .	. .	. .	22 35 19 07	+ 0.09	. . . . .	. .
	17	α	Piscis Aust. .	9	50 28.41	− 1.15	+ **23.54**	69 4 . .	. .	. .	22 50 51.04	+ 0.25	. . . . .	. .
	18		B. A. C. 8032 .	9	57 24.23	− 0.20	+ 23.79	11 23 46.20	+ 4 44.13	+ 12.0	22 57 47.82	− 0.92	62 35 3.5	+ 0.4
	19	α	Pegasi . . .	9	58 14.07	− 0.43	+ **23.82**	24 15 59.52	+ 4 46.76	+ 26.7	22 58 37.43	− 0.01	75 27 25.2	+ 2.4
	20		B. A. C. 166 .	9	32 20.82	− 0.15	+ 23.86	8 37 49.12	+ 4 15.84	+ 9.1	0 32 44.53	+ 0.56	59 48 35.3	+ 7.8
	21	β	Ceti	9	37 2.10	− 0.94	+ **23.78**	57 27 53.20	+ 4 0.92	+ 1 32.8	0 37 25 02	+ 0.14	108 89 48.1	+ 0.7
	22		B. A. C. 259 .	9	49 31.20	+ 0.01	+ 23.87	0 59 49.08	+ 3 42.07	+ 1.1	0 49 55.08	+ 0.63	52 9 53.5	+11.1
	23	ε	Piscium . .	9	56 10.13	− 0.54	+ **23.93**	31 33 52.02	+ 5 30.25	+ 36.5	0 56 33.47	− 0.10	82 46 20.0	+ 1.9
	24	β	Andromedæ .	9	2 26.57	− 0.05	+ 23.88	3 51 50.30	+ 3 29.75	+ 4.1	1 2 50.40	+ 0.47	55 1 45.3	+11.0
	25		Polaris . . .	4	11 52.55	+36.15	+ 23.89	310 9 49.25	+ 5 24.12	− 1 9.9	1 12 52.59	− 2.31	1 20 24.7	+ 0.5
	26		B. A. C. 1448 .	5	36 59.45	+ 4.88	+ 24.18	317 51 47.42	+ 3 18.75	− 54.2	4 37 28.51	− 4.11	9 0 33.2	+27.1
	27	β	Orionis . . .	9	8 15.48	− 0.75	+ **24.21**	47 7 53.60	+ 5 25.18	+ 1 5.1	5 8 38.95	+ 0.01	98 20 45.1	+ 3.3
	28	β	Tauri . . .	9	18 8.52	− 0.14	+ **24.26**	10 17 45.30	+ 5 26.00	+ 11.1	5 18 32.61	− 0.02	61 29 43.6	+ 1.1
	29	δ	Orionis . . .	9	25 21.23	− 0.63	+ **24.22**	39 11 52.45	+ 4 26.22	+ 49.3	5 25 44.84	− 0.01	90 23 29.2	+ 1.4
	30		Weisse 633 . .	5	26 30.36	− 0.72	+ 24.24	45 23 59.78	+ 3 41.13	+ 1 1.3	5 26 53.88	− 1.41	96 35 3.4	+ 1.2
	31		Weisse 632 . .	3	26 30.68	− 0.72	+ 24.24	45 23 59.78	+ 4 18.66	+ 1 1.3	5 26 54.20	− 1.41	96 35 40.9	+ 1.1
	32		B. A. C. 1794^1 .	6	34 11.02	− 0.66	+ 24.25	40 47 50.82	+ 5 29.22	+ 52.3	5 34 34.61	− 1.46	92 0 33.5	+ 2.3
	33		B. A. C. 1794^2 .	5	34 11.16	− 0.66	+ 24.25	40 47 50.82	+ 5 31.91	+ 52.3	5 34 34.75	− 1 46	92 0 36.2	+ 2.3
	34		B. A. C. 1843 .	9	41 33.40	− 0.78	+ 24.26	48 31 53.40	+ 3 32.71	+ 1 8.5	5 41 56.88	− 1.47	99 42 55.8	+ 0.2
	35		B. A. C. 1891 .	9	48 17.48	− 1.22	+ 24.27	72 35 51.58	+ 4 27.95	+ 3 11.7	5 48 40.52	− 1.49	123 49 52.4	− 4.9
	36		Piazzi VI, 34 .	9	6 46.73	− 1.54	+ 24.29	83 55 50.75	+ 4 27.84	+ 8 50.7	6 7 9.48	− 1.63	135 15 30.5	− 6.2
	37		B. A. C. 2036 .	3	12 28.77	− 1.33	+ 24.30	76 25 52.62	+ 5 29.89	+ 4 8.3	6 12 51.74	− 1.59	127 41 52.0	− 5.2
	38		B. A. C. 2054 .	9	15 23.53	− 1.37	+ 24.30	78 9 54.10	+ 5 7.22	+ 4 44.7	6 15 46.46	− 1.61	129 26 7.2	− 5.4
	39		B. A. C. 2098 .	3	21 29.16	− 1.41	+ 24.31	79 41 53.32	+ 41.20	+ 5 24.0	6 21 52.06	− 1.64	130 54 19.7	− 5.5
	40		B. A. C. 2117 .	9	24 25.10	− 1.41	+ 24.32	79 41 53.32	+ 6 13.64	+ 5 26.8	6 24 47.91	− 1.65	130 59 55.0	− 5.5
	41		B. A. C. 2288 .	8	52 32.16	− 1.27	+ 24.35	74 5 52.45	+ 5 1.13	+ 3 31.4	6 52 55.24	− 1.70	125 20 46.2	− 4.5
	42		Anonymous. .	8	52 49.72	− 1.27	+ 24.36	74 5 52.45	+ 2 24.05	+ 3 31.1	6 53 12.81	− 1.70	125 18 8.8	− 4.5
	43		B. A. C. 2471 .	9	21 46.84	− 1.25	+ 24.39	72 39 53.68	+ 4 15.66	+ 3 13.7	7 22 9.98	− 1.76	123 53 44.2	− 4.2
	44		B. A. C. 2502 .	9	29 2.72	− 1.30	+ 24.40	74 53 51.02	+ 28.01	+ 3 42.5	7 29 25.82	− 1.79	126 4 22.7	− 4.2
	45		B. A. C. 2536 .	9	33 55.24	− 1.30	+ 24.40	74 53 51.02	+ 9 8.88	+ 3 44.7	7 31 18.34	− 1.80	126 13 5.8	− 4.2
	46		B. A. C. 2561 .	2	38 20.66	− 1.30	+ 24.41	74 31 50.98	+ 3 46.59	+ 3 37.9	7 38 43.77	− 1.80	125 45 36.7	− 4.2
	47		B. A. C. 2572 .	9	39 18.70	1.30	+ 24.41	74 31 50.98	+ 4 30.21	+ 3 38.1	7 39 41.81	− 1.80	125 46 20.5	− 4.1
	48	λ	Ursæ Min., s. p.	3	46 1.80	−46.26	+ 24.42	307 45 48.75	+ 5 5.56	− 1 18.3	19 45 39.96	− 2.81	358 55 57.2	+ 1.4
	49		B. A. C. 2717 .	9	59 57.64	− 1.23	+ 24.44	71 59 55.02	+ 5 15.33	+ 3 6.7	8 0 20.85	− 1.83	123 14 38.3	− 3.9
	50		B. A. C. 2719^1 .	6	0 38.63	− 1.23	+ 24.44	71 59 55.02	+ 3 49.22	+ 3 6.4	8 1 1.84	− 1.83	123 13 11.8	− 3.9

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.14	32.0	29.7
30.19	32.4	31.2
30.20	37.5	36.5
30.16	40.3	39.8
30.05	45.0	43.8
30.15	45.5	44.2
30.15	40.6	37.8
30.15	35.6	32.5

For summary of the elements of reduction see page 3.

25. Four bisections.
23, 30, 31, 43, 46. One bisection.
48. Three bisections.

ZENITH-POINT CORR.

No. 1 to 5 + 55.87″
No. 6 to 25 + 52.30
No. 26 to 50 + 54.57

No.	Parallax.	Semi-diam.	Defective. Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	− 4.9	+ 6.0	. .	+ 1.1
12	− 4.9	− 6.0	+ 0.1	− 10.8
14	− 7.1	− 16 12.2	. .	− 16 19.3
15	− 7.1	+ 16 12.2	. .	+ 16 5.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Feb. 10	1	B. A. C. 2719² .	5	0 40.59	− 1.23	+ 24.44	71 59 55.02	+ 3 48.33	+ 3 6.4	8 1 3.80	− 1.83	123 13 11.0	− 3.9
F.	2	B. A. C. 2778 (R.)	.	. . .	. .	. .	150 35 53.48	+ 4 48.98	− 34.3	. . . .	. .	80 26 13.0	− 0.6
	3	B. A. C. 2778 .	.	. . .	. .	. .	29 13 49.22	+ 5 29.70	− 34.3	. . . .	. .	80 26 14.4	− 0.6
	4	B. A. C. 2819 (R.)	.	. . .	. .	. .	202 9 55.82	+ 3 45.23	+ 25.0	. . . .	. .	28 52 15.2	+ 5.7
	5	B. A. C. 2819 .	.	. . .	. .	. .	337 41 54.75	+ 4 29.17	− 25.0	. . . .	. .	28 52 20.1	+ 5.7
	6	B. A C. 2941 .	9	35 27.27	− 1.40	+ 24.48	78 33 50.75	+ 4 38.44	+ 4 56.1	8 35 50.35	− 1.89	120 49 46.5	− 3.6
	7	ε Hydræ . . .	9	39 53.90	− 0.54	+ **24.46**	31 55 48.90	+ 5 7.93	+ 38.2	8 40 17.84	− 0.03	83 7 56.2	+ 2.7
	8	κ Cancri . . .	9	0 43.27	− 0.48	+ **24.46**	27 39 55.75	+ 3 33.23	+ 32.1	9 1 7.30	+ 0.08	78 50 22.3	+ 3.3
	9	B. A. C. 3192¹ .	9	15 10.46	− 1.20	+ 24.53	70 1 54.30	+ 3 23.55	+ 2 47.2	9 15 33.79	− 1.87	121 14 26.2	− 3.7
	10	α Hydræ . . .	9	21 10.87	− 0.78	+ **24.48**	46 55 54.82	+ 4 19.72	+ 1 5.4	9 21 34.62	+ 0.05	98 7 41.1	+ 2.3
	11	Atala. . . .	9	40 39.00	− 0.09	+ 24.56	5 47 48.32	+ 6 23.05	+ 6.3	9 41 3.47	. .	57 0 38.9	− 0.4
	12	α Leonis . . .	9	1 27.32	− 0.46	+ **24.57**	26 13 48.05	+ 5 27.44	+ 30.3	10 1 51.45	− 0.02	77 26 7.0	+ 4.6
	13	Weisse (2) 234 .	7	12 31.25	− 0.32	+ 24.60	18 19 57.32	+ 4 15.04	+ 20.4	10 12 58.53	− 2.35	69 30 54.0	− 8.0
	14	γ¹ Leonis . . .	5	12 49.31	− 0.32	+ **24.73**	18 19 57.32	+ 5 45.66	+ 20.4	10 13 13.59	− 0.11	69 32 24.6	+ 4.6
	15	γ² Leonis . . .	5	12 49.85	− 0.32	+ 24.60	18 19 57.32	+ 5 43.01	+ 20.4	10 13 14.13	− 2.35	69 32 21.9	− 8.0
12	16	α Andromedæ .	9	1 34.33	− 0.08	+ **27.00**	10 24 . .	. . .	. .	0 2 1.25	+ 0.03	. . . .	. .
P.	17	γ Pegasi . . .	9	6 27.11	− 0.30	+ **26.99**	24 18 . .	. . .	. .	0 6 53.81	+ 0.02	. . . .	. .
	18	α Cassiopeæ . .	9	33 2.89	+ 0.67	+ 27.00	342 58 . .	. . .	. .	0 33 30.56	− 0.07	. . . .	. .
	19	B. A. C. 262. .	9	51 21.63	+10.04	+ 27.01	313 14 . .	. . .	. .	0 51 58.68	+16.03	. . . .	. .
	20	ε Piscium . . .	9	56 6.93	− 0.40	+ **27.01**	31 34 . .	. . .	. .	0 56 33.54	− 0.01	. . . .	. .
	21	β Andromedæ .	8	2 23.44	+ 0.04	+ 27.01	3 52 . .	. . .	. .	1 2 50.49	+ 0.50	. . . .	. .
	22	Polaris . . .	7	11 51.39	+34.41	+ 27.01	310 10 . .	. . .	. .	1 12 52.81	− 0.35	. . . .	. .
E.	23	α Lyræ. . . .	9	32 18.30	+ 0.03	+ **27.40**	0 9 48.48	+ 3 57.50	+ 0.2	18 32 45.76	+ 0.06	51 20 7.4	− 1.4
	24	β Lyræ. . . .	9	45 4.26	− 0.15	+ **27.47**	5 35 41.23	+ 4 47.69	+ 6.2	18 45 31.64	0.00	56 47 3.3	− 1.3
	25	ζ Aquilæ . . .	9	59 18.12	− 0.50	+ **27.41**	25 7 47.43	+ 4 41.06	+ 29.3	18 59 45.05	+ 0.13	76 19 19.0	− 1.3
	26	Mercury II, C. .	9	6 34.00	− 0.99	+ 27.43	57 37 48.82	+ 3 49.11	+ 1 37.5	20 7 0.44	− 0.28	108 49 36.6	. .
	27	Venus II, S. .	9	27 7.83	− 1.00	+ 27.43	58 29 52.83	+ 4 21.37	+ 1 40.7	20 27 34.26	− 0.38	109 12 16.1	. .
	28	Venus N. . .	.	. . .	. .	. .	58 29 52.83	+ 4 7.42	+ 1 40.7	. . . .	. .	109 42 2.1	.
13	29	Sun I, N. . .	7	48 16.72	− 0.83	+ 27.42	51 39 50.78	+ 4 43.52	+ 1 17 8	21 48 43.26	. .	102 52 13.3	. .
	30	Sun II, S. . .	8	50 30.52	− 0.88	+ 27.42	52 11 49.03	+ 5 12.35	+ 1 19.4	21 50 57.06	. .	103 24 42.0	. .
	31	α Andromedæ .	3	1 33.90	− 0.12	+ **27.46**	10 23 45.83	+ 4 56.49	+ 11.3	0 2 1.20	− 0.01	61 35 14.8	+ 1.1
	32	γ Pegasi . . .	9	6 26.71	− 0.37	+ **27.46**	24 17 48.85	+ 5 22.92	+ 27.7	0 6 53.76	− 0.03	75 30 0.7	+ 2.2
	33	B. A. C. 166. .	9	32 17.32	− 0.06	+ 27.42	8 37 41.70	+ 4 25.29	+ 9.3	0 32 44 68	+ 0.58	59 48 37.5	+ 7.4
	34	β Ceti	5	36 58.49	− 0.92	+ **27.35**	57 27 48.83	+ 4 24.03	+ 1 15.6	0 37 24.99	+ 0.13	108 39 49.7	+ 2.5
	35	β Andromedæ .	9	2 23.02	+ 0.04	+ 27.42	3 51 51.13	+ 3 29.71	+ 4.2	1 2 50.48	+ 0.51	55 1 46.2	+10.6
	36	Polaris . . .	5	11 49.40	+38.66	+ .4	310 9 52.42	+ 5 25.11	− 1 11.8	1 12 55.48	+ 3.20	1 20 26.9	+ 2.2
	37	δ Ursæ Min., S P.	7	11 29.51	−14.94	+ 27.	305 27 51.20	+ 3 23.27	− 1 27.0	18 11 42.16	+ 1.11	356 36 8.7	+ 2.9
	38	μ Geminorum. .	9	15 5.70	− 0.28	+ **27.60**	16 13 49.60	+ 4 55.50	+ 18.2	6 15 33.01	− 0.03	67 25 24.5	+ 2.3
	39	B. A. C. 2079 .	5	19 20.36	. .	+ 27.59	75 23 52.45	+ 4 38.04	+ 3 56.4	6 19 46 60	− 1.56	126 38 48.1	− 5.6
	40	Brisbane 1230 .	5	19 24.56	− 1.35	+ 27.59	75 23 52.45	+ 4 12.70	+ 3 56.2	6 19 50.80	− 1.56	126 38 22.6	− 5.6
	41	γ Geminorum. .	9	30 11.02	. .	+ **27.58**	22 17 47.28	+ 5 13.76	+ 25.6	6 30 38.22	− 0.02	73 29 47.8	+ 3.1
	42	α Canis Majoris .	9	39 18.62	− 0.94	+ **27.58**	55 19 54.80	+ 5 15.79	+ 1 30.1	6 39 45.27	+ 0.06	106 33 1.9	+ 2.5
	43	51 Cephei . . .	5	41 59.76	+17.03	+ 27.59	311 35 47.93	+ 4 43.82	− 1 9.9	6 42 44.36	− 0.17	2 45 43.1	+ 0.8
	44	B. A. C. 2305 (R.)	.	. . .	. .	. .	161 47 47.00	+ 3 56.04	− 20.4	. . . .	. .	69 14 58.0	+ 5.4
	45	B. A. C. 2305 .	.	. . .	. .	. .	18 3 47.93	+ 4 30.05	+ 20.4	. . . .	. .	69 14 59.6	+ 5.4
	46	B. A. C. 2372 .	9	6 47.80	− 1.42	+ 27.59	77 37 51.25	+ 5 12.56	+ 4 40.0	7 7 13.97	− 1.71	128 54 5.0	− 5.4
	47	δ Geminorum (R.)	.	. . .	. .	. .	163 13 49.48	+ 5 21.80	− 18.7	. . . .	. .	67 47 28.6	− 0.5
	48	δ Geminorum. .	.	. . .	. .	. .	16 35 45.68	+ 5 5.08	+ 18.7	. . . .	. .	67 47 30.7	+ 1.6
	49	B. A. C. 2446 .	8	17 29.54	− 1.24	+ 27.59	70 31 54.33	+ 7 34.06	+ 2 56.0	7 17 55.89	− 1.72	121 48 45.6	− 4.7
	50	B. A. C. 2449 .	8	17 53.95	− 1.24	+ 27.59	70 31 54.33	+ 12.16	+ 2 54.8	7 18 20.30	− 1.72	121 41 22.5	− 4.8

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
8	30.16	34.0	29.4
10	30.06	33.5	28.8
12	30.15	33.2	28.5
24	30.47	27.0	26.0
28	30.48	31.0	30.6
30	30.45	32 6	31.7
36	30.44	36.0	36.0
38	30.49	29.0	26.5

For summary of the elements of reduction see page 3.

13, 14, 15. One bisection.
36, 37, 43. Three bisections.

ZENITH-POINT CORR.

No. 1 to 15 + 54.57″
No. 23 to 36 + 55.98
No. 37 to 50 + 56.96

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	− 8.8	. . .	+ 0.3	− 8.5
27	− 4.8	− 7.0	+ 0.0	− 11.8
28	− 4.8	+ 7.0	. .	+ 2.2
29	− 7.0	+ 16 14.3	. .	+ 16 7.3
30	− 7.1	− 16 14.3	. .	− 16 21.4

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
'7.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
13	1	B. A. C. 2502	9	28 59.64	− 1.35	+ 27.59	74 53 51.80	+ 24.31	+ 3 47.9	7 29 25.88	− 1.76	126 4 25.2	− 5.0
	2	Anonymous	9	32 31.50	− 1.35	+ 27.59	74 53 51.80	+ 4 31.74	+ 3 49.0	7 32 57.74	− 1.76	126 8 33.7	− 5 0
	3	B. A. C. 2536	9	33 52.17	− 1.35	+ 27.59	74 53 51.80	+ 9 4.00	+ 3 50.1	7 34 18.41	− 1.77	126 13 7.1	− 5.0
	4	B. A. C. 2609 (R.)	.	. . .	. .	. .	188 53 47.62	+ 5 24.27	+ 9.9	. . . .	. .	42 6 59.4	+ 7.6
	5	B. A. C. 2609	.	. . .	. .	. .	350 55 49.35	+ 5 0.80	− 9.9	. . . .	. .	42 7 1.5	+ 7.6
	6	B. A. C. 2697 (R.)	.	. . .	. .	. .	192 53 48.15	+ 3 56.44	+ 14.4	. . . .	. .	38 8 22.2	+ 7.1
	7	B. A. C. 2697	.	. . .	. .	. .	346 57 51.30	+ 4 24.45	− 14.4	. . . .	. .	38 8 22.6	+ 7.1
	8	Austria	9	24 9.85	− 0.56	+ 27.59	32 1 49.88	+ 7 13 73	+ 39.2	8 24 36.88	. .	83 16 4.0	− 3.0
	9	B. A. C. 2900	9	30 17.11	− 1.46	+ 27.59	78 17 49.70	+ 3 54.07	+ 4 56.0	8 30 43.24	− 1.87	129 33 1.0	− 4.6
	10	B. A. C. 2941	9	35 24.10	− 1.46	+ 27.59	78 33 49.55	+ 4 31.72	+ 5 3.1	8 35 50.23	− 1.88	129 49 45.6	− 4.5
	11	B. A. C. 2980	9	41 31.90	− 1.32	+ 27.59	72 55 50.63	+ 4 55.95	+ 3 22 3	8 41 58 17	− 1.86	124 10 30.1	− 4.5
	12	Lacaille 3525	8	42 6.36	− 1.32	+ 27.59	72 55 50.63	+ 3 32.27	+ 3 21.0	8 42 32.63	− 1.86	124 9 6.0	− 4.5
	13	B. A. C. 3192¹	5	15 7.33	− 1.24	+ 27.59	70 1 52.18	+ 3 23.77	+ 2 51.3	9 15 33.68	− 1.88	121 14 28.5	− 4.5
	14	B. A. C. 3192²	3	15 7.68	− 1.24	+ 27.59	70 1 52.18	+ 3 23.54	+ 2 51.3	9 15 34.03	− 1.88	121 14 28.2	− 4.5
	15	B. A. C. 3230	9	21 13.62	− 1.47	+ 27.59	78 41 50.28	+ 4 58.29	+ 5 7.2	9 21 39.74	− 1.90	129 58 17.0	− 4.1
	16	B. A. C. 3257	9	25 27.39	− 1.47	+ 27.59	78 41 50.28	+ 2 32.16	+ 5 6.1	9 25 53.51	− 1.90	129 55 49.7	− 4 1
	17	Atala	9	37 48.40	− 0.08	+ 27.59	5 39 53.15	+ 6 21.46	+ 6.3	9 35 15 91	. .	56 52 42.1	− 0 4
	18	Uranus I, C.	6	40 12.14	− 0.43	+ 27.59	24 5 49.90	+ 3 35.29	+ 28.1	9 40 39.30	+ 0.18	75 16 14.5	− 0.2
	19	Uranus, II	5	40 12.50	− 0.43	+ 27.59	24 5 . .	. .	. .	9 40 39.66	− 0.18	. . . . .	. .
	20	μ Leonis	9	45 21.14	− 0.22	+ **27.57**	12 13 48.33	+ 4 36.47	+ 13.7	9 45 48.51	+ 0.06	63 24 59.7	+ 1.5
	21	D. M. 17°, 2160.	9	51 27.87	− 0 39	+ 27 59	21 31 50.93	+ 4 50.89	+ 24.8	9 51 55.07	− 2.34	72 43 27.8	− 6.5
	22	Weisse (2) 1158.	9	55 11.10	− 0.39	+ 27.59	21 47 49.08	+ 3 53.52	+ 25.1	9 55 38.30	− 2.33	72 58 28.9	− 6.8
	23	α Leonis	9	1 24.37	− 0.47	+ **27.55**	26 13 46.90	+ 5 25.35	+ 31.0	10 1 51.49	0.00	77 26 4.4	+ 1.9
	24	Weisse (2) 74	9	4 59.52	− 0.42	+ 27.59	23 19 52.23	+ 4 30.11	+ 27.1	10 5 26.69	− 2.29	74 31 10.6	− 7.4
	25	Weisse (2) 234	5	12 31.39	− 0.33	+ 27.59	18 19 54 45	+ 4 17.61	+ 20.8	10 12 58.65	− 2.39	69 30 54.1	− 8.0
	26	γ¹ Leonis	6	12 46.43	− 0.33	+ **27.66**	18 19 54.45	+ 5 46.61	+ 20.9	10 13 13.69	− 0 05	69 32 23.2	+ 3.2
	27	γ² Leonis	5	12 46.50	− 0.33	+ 27.59	18 19 54.45	+ 5 45.02	+ 20 9	10 13 14.06	− 2.39	69 32 22.5	− 8.0
14	28	α Aurigæ	.	. . .	. .	. .	352 57 50.93	+ 3 25.82	− 0 7.6	. . . .	. .	44 7 30.4	+ 2.2
7.	29	Durch. 27°, 744	9	8 43.87	− 0.13	+ 27.67	11 13 51.33	+ 4 43.29	+ 12.4	5 9 11.41	− 1.46	62 25 8.2	+ 12.0
	30	B. A. C. 1650	8	12 37.91	− 1.18	+ 27.67	73 45 54.48	+ 5 21.77	+ 3 30 5	5 13 4.40	− 1.28	125 1 8.0	− 5 9
	31	β Tauri	9	18 4.90	− 0.12	+ **27 80**	10 17 49.90	+ 5 23.39	+ 11.3	5 18 32.46	− 0.11	61 29 45.8	+ 3.5
	32	δ Orionis	9	25 17.72	− 0.58	+ **27.62**	39 11 54.25	+ 4 25.05	+ 50.5	5 25 44 82	+ 0.03	90 23 31.0	+ 3.0
	33	Weisse 633	5	26 26.88	− 0.67	+ 27.68	45 23 54.28	+ 3 46.31	+ 1 2.7	5 26 53.89	− 1 36	96 35 4 5	+ 0.8
	34	Weisse 632	6	26 27.15	− 0.67	+ 27.68	45 23 54 28	+ 4 25.67	+ 1 2.7	5 26 54.16	− 1.36	96 35 43 9	+ 0.8
	35	α Columbæ	6	34 46.66	− 1.16	+ **27.63**	72 54 . .	. .	. .	5 35 13.19	+ 0.04	. . . .	. .
	36	B. A. C. 1843	9	41 29.96	− 0.72	+ 27.69	48 31 55.95	+ 3 28.48	+ 1 10.0	5 41 56 93	− 1.42	99 42 55.6	− 0.2
	37	B. A. C. 1891	9	48 13 92	− 1.15	+ 27.69	72 35 51.83	+ 4 24.53	+ 3 15.9	5 48 40.46	− 1.42	123 49 53.5	− 5.5
	38	Taylor 2245.	3	51 48.60	− 1.11	+ 27.69	70 45 57.75	+ 4 25.84	+ 2 56.4	5 52 15.18	− 1.43	121 59 41.2	− 5.2
	39	Piazzi VI, 6	9	2 28.21	− 1.36	+ 27.69	80 59 58.93	+ 4 36.46	+ 6 18.0	6 2 54.54	− 1.51	132 17 14.6	− 6.6
	40	Piazzi VI, 12	.	. . .	. .	. .	80 51 55.25	+ 3 49.92	+ 6 12.2	. . . .	. .	132 8 18 5	− 6.6
	41	B. A. C. 2054	6	15 20.09	− 1.29	+ 27.70	78 9 56 93	+ 4 59.84	+ 4 50 3	6 15 46.50	− 1.54	129 26 8.3	− 6.1
	42	B. A. C. 2122	6	24 42.53	− 1.32	+ 27.71	79 3 53.78	+ 2 11.07	+ 5 12.7	6 25 8.92	− 1.57	130 17 38.7	− 6.2
	43	Brisbane 1256	8	24 48.28	− 1.32	+ 27.71	79 3 53.78	+ 2 38.20	+ 5 12.9	6 25 14.67	− 1.57	130 17 59.9	− 6.2
	44	B. A. C. 2135	9	26 16.86	− 1.32	+ 27.71	79 3 53.78	+ 6 21.47	+ 5 14.6	6 26 43.25	− 1.58	130 21 44.9	− 6.2
	45	B. A. C. 2207¹	5	37 41.25	− 1.27	+ 27.71	77 1 57.40	+ 4 9.30	+ 4 25.1	6 38 7.69	− 1.61	128 16 53.0	− 5.8
	46	B. A. C. 2207²	6	37 41.90	− 1.27	+ 27.71	77 1 57.40	+ 4 9.08	+ 4 25.1	6 38 8.34	− 1.61	128 16 52.8	− 5.8
	47	B. A. C. 2258	9	46 57.50	− 1.22	+ 27.72	74 49 55.55	+ 4 56.12	+ 3 46.5	6 47 24.00	− 1.63	126 4 59.4	− 5.5
	48	B. A. C. 2295	9	53 30.17	− 1.17	+ 27.72	72 41 54.18	+ 5 19.13	+ 3 17.9	6 53 56.72	− 1.65	123 56 52.4	− 5.2
	49	Lalande 13681	9	58 2.09	− 0.13	+ 27.72	10 25 50.35	+ 4 57.91	+ 11.5	6 58 29.68	− 2.18	61 37 21.0	+ 7 2
	50	Lalande 13700	6	58 36.27	− 0.13	+ 27.72	10 25 50.35	+ 3 30.94	+ 11.5	6 59 3 86	− 2.18	61 35 54.0	+ 7.1

Barom.	At. Ther.	Ex. Ther.	*For summary of the elements of reduction see page 3*	No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
in.	°	°			' "	' "	' "	' "
30.48	25.0	23.0		18	− 0.2	. .	. .	− 0.2
30.43	32.5	28.8						

43, 49, 50. One bisection.

ZENITH-POINT CORR

No. 1 to 27 + 56.96"
No. 28 to 50 + 55.30

DATE AND OBS'R.	Number	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ' ″	' ″	' ″	h. m. s.	s.	° ' ″	″
Feb. 14	1	Lalande 13724 .	9	59 16.41	− 0.13	+ 27.72	10 25 50.35	+ 5 39.67	+ 11 5	6 59 44.00	− 2.18	61 38 2.7	+ 7
F.	2	Lalande 13757 .	9	0 11.07	− 0 13	+ 27.72	10 25 50.35	+ 3 36.57	+ 11.5	7 0 38.66	− 2.18	61 35 59.6	+ 7
	3	Durch. 28°, 1331	9	3 33.41	− 0.13	+ 27.72	10 25 50.35	+ 4 5.46	+ 11.5	7 4 1.00	− 2.20	61 36 28.5	+ 6
	4	Lalande 13905 .	9	4 16.88	− 0.13	+ 27.73	10 25 50.35	+ 2 42.07	+ 11.5	7 4 44.48	− 2.21	61 35 5.1	+ 6
	5	α Canis Minoris .	9	32 20.41	− 0.50	+ **27.78**	33 15 54.08	+ 4 46.51	+ 40.8	7 32 53.65	− 0.14	84 27 43.2	+ 2
	6	β Geminorum. .	9	37 21.92	− 0.13	+ **27.81**	10 29 55.53	+ 4 12.71	+ 11.6	7 37 49.53	− 0.09	61 40 41.0	+ 3
	7	λ Ursæ Min., s. p. .	5	45 59.86	−43.58	+ 27.74	307 46 . .	. . . .	. .	19 45 44.02	− 0.73	. . . . .	.
	8	15 Argus . . .	5	1 53.52	− 0.98	+ **27.63**	62 43 56.00	+ 4 52.18	+ 2 0.3	8 2 20.29	+ 0.05	113 57 9.7	+ 3
	9	B. A. C. 3081 .	9	55 5.50	− 1.35	+ 27.77	79 29 56.75	+ 4 53.57	+ 5 27.8	8 55 31.92	− 1.89	130 46 39.3	− 5
	10	B. A. C. 3158 .	7	9 38.34	− 1.25	+ 27.77	75 51 56.53	+ 3 16.99	+ 4 3.8	9 10 4.86	− 1.88	127 5 38.5	− 4
	11	B. A. C. 3192¹ .	6	15 7.30	− 1.12	+ 27.77	70 1 54.83	+ 3 20.83	+ 2 50.3	9 15 33.95	− 1.88	121 14 27.2	− 4
	12	B. A. C. 3192² .	5	15 7.47	− 1.12	+ 27.77	70 1 54.83	+ 3 20.14	+ 2 50.3	9 15 34.12	− 1.88	121 14 26.5	− 4
	13	B. A. C. 3230 .	9	21 13.46	− 1.34	+ 27.77	78 41 55.63	+ 4 52.98	+ 5 5.4	9 21 39.89	− 1.90	129 58 15.2	− 4
	14	B. A. C. 3257 .	9	25 26.91	− 1.34	+ 27.78	78 41 55.63	+ 2 30.36	+ 5 4.4	9 25 53.35	− 1.90	129 55 51.6	− 4
	15	α Leonis . . .	9	1 24.07	− 0.41	+ **27.80**	26 13 52.80	+ 5 22.20	+ 30.8	10 1 51.45	− 0.05	77 26 7.0	+ 4
	16	γ¹ Leonis . . .	6	12 46.27	− 0.29	+ **27.78**	18 19 54.58	+ 5 47 93	+ 20.8	10 13 13.77	+ 0.03	69 32 24.5	+ 4
	17	γ² Leonis . . .	5	12 46.53	− 0.29	+ 27.79	18 19 54.58	+ 5 49 88	+ 20.7	10 13 14.03	− 2.40	69 32 26.4	− 8
S.	18	γ Aquilæ . . .	9	39 56.66	− 0.50	+ **28.14**	28 29 56.65	+ 4 30.26	+ 33.5	19 40 24.31	+ 0.04	79 41 21.6	+ 1
	19	α Aquilæ . . .	9	44 18.89	− 0.53	+ **28.15**	30 15 54.78	+ 4 41.65	+ 36.0	19 44 46.50	+ 0.03	81 27 33.6	+ 1
	20	Venus I, N. .	4	37 26.10	− 1.05	+ 28.14	57 57 56.70	+ 3 51.31	+ 1 37.2	20 37 53.19	+ 0.32	109 9 46.4	.
	21	Venus II, S. .	5	37 26.79	− 1.05	+ 28.14	57 57 56.70	+ 4 3.46	+ 1 37.1	20 37 53.88	− 0.37	109 9 58.5	.
15	22	Sun I, N. . .	9	56 4.24	− 0.90	+ 28.12	50 50 54.73	+ 3 36.24	+ 1 14.1	21 56 31.46	+66.52	102 11 6.3	.
	23	Sun II, S. . .	9	58 17.28	− 0.90	+ 28.12	51 31 53.18	+ 4 2.41	+ 1 15.6	21 58 44.50	−66.52	102 43 32.4	.
	24	ζ Pegasi . . .	9	34 51 44	− 0 47	+ **28.12**	28 37 50.40	+ 3 56.76	+ 32.7	22 35 19.08	+ 0.08	79 48 41.1	+ 1
	25	α Piscis Australis	9	50 24.08	− 1.29	+ **28 03**	69 3 53 65	+ 3 42.65	+ 2 35.2	22 50 50.90	+ 0.09	120 16 32.7	+ 1
	26	α Pegasi . . .	5	58 9.73	− 0.37	+ **28.11**	24 15 53.23	+ 4 44.29	+ 27.0	22 58 37.47	+ 0.02	75 27 25.7	+ 2
	27	α Andromedæ .	9	1 23.09	− 0.06	+ **28.21**	10 23 51.38	+ 4 53.75	+ 11.0	0 2 1.13	− 0.08	61 35 17.3	+ 3
	28	γ Pegasi . . .	9	6 26.03	− 0.36	+ **28.13**	24 17 50.55	+ 5 23.86	+ 27.0	0 6 53.77	− 0.02	75 30 2.6	+ 4
	29	β Ceti	9	36 57.89	− 1.01	+ **28.02**	57 27 52.73	+ 4 3.22	+ 1 33.1	0 37 24.97	+ 0.13	108 39 50.3	+ 3
	30	Polaris . . .	3	11 34.77	+45.95	+ 28.08	310 9 54.48	+ 5 20.12	− 1 10 0	1 12 48.80	− 1.84	1 20 25.8	+ 0
	31	β Orionis . . .	9	8 11.37	− 0.87	+ **28 37**	47 7 52.95	+ 5 25.05	+ 1 5.1	5 8 38.80	− 0.07	98 20 44.3	+ 2
	32	β Tauri . . .	9	18 4.37	− 0.16	+ **28.36**	10 17 48 63	+ 5 22.78	+ 11.0	5 18 32.51	− 0.05	61 29 43.6	+ 1
	33	δ Orionis . . .	9	25 17.30	− 0.73	+ **28.18**	39 11 52.85	+ 4 26 57	+ 49.3	5 25 44.87	+ 0.09	90 23 29.9	+ 1
	34	θ¹ Orionis . . .	8	28 47.98	− 0.82	+ 28.31	44 15 50.90	+ 5 9.79	+ 58.9	5 29 15.47	− 1.36	95 28 20.8	+ 1
	35	θ² Orionis . . .	6	28 51 57	− 0.82	+ 28.31	44 15 50.90	+ 6 44.50	+ 59.0	5 29 22.06	− 1.36	95 29 55.6	+ 1
	36	B. A. C. 1849(R.)	.	. . .	. .	. .	200 53 50.92	+ 3 56.96	+ 23.1	. . . .	. .	30 8 13.2	+20
	37	B. A. C. 1849 .	.	. . .	. .	. .	338 57 53.10	+ 4 25.25	− 23.1	. . . .	. .	30 8 16.5	+20
	38	B. A. C. 1892 .	9	48 15.37	− 1.55	+ 28.31	77 17 51.13	+ 4 44.66	+ 4 23.8	5 48 42.13	− 1.41	128 33 20.8	− 6
	39	Piazzi VI, 34 .	5	6 42.77	− 1.77	+ 28.31	83 55 51.50	+ 4 28.04	+ 8 48.8	6 7 9.31	− 1.51	135 15 29.5	− 7
	40	δ Ursæ Min., s. p. .	3	11 31.47	−17.92	+ 28.31	305 27 51.33	+ 3 18.88	− 1 24.6	18 11 41.86	+ 0.19	356 36 6.8	+ 1
	41	B. A. C. 2153 .	9	28 37 17	− 1.55	+ 28.31	77 15 52.70	+ 5 24.40	+ 4 24.0	6 29 3.93	− 1.56	128 32 2.3	− 6
	42	B. A. C. 2225 .	9	41 33.93	− 1.52	+ 28.32	76 27 53.03	+ 26.61	+ 4 7.1	6 42 0.73	− 1.60	127 38 47.9	− 5
	43	B. A. C. 2231 .	9	42 43.81	− 1.53	+ 28.32	76 27 53.03	+ 9 24.79	+ 4 9.8	6 43 10.60	− 1 60	127 47 48.8	− 5
	44	B. A. C. 2295	9	53 29.80	− 1.42	+ 28.32	72 41 52.60	+ 5 23.99	+ 3 13.4	6 53 56.76	− 1.63	123 56 51.2	− 5
	45	B. A. C. 2372 .	9	6 47.09	− 1.56	+ 28.32	77 37 49.50	+ 5 21.73	+ 4 32.4	7 7 13.85	− 1.68	128 54 4.8	− 5
	46	B. A. C. 2427 .	9	13 56 97	− 1.56	+ 28.32	77 43 51.90	+ 4 29.74	+ 4 34.3	7 14 23.73	− 1.70	128 59 17.1	− 5
	47	B. A. C. 2471 .	9	21 43.06	− 1.42	+ 28.32	72 39 56.18	+ 4 14.66	+ 3 13.0	7 22 9.96	− 1.71	123 53 45.0	− 5
	48	B. A. C. 2477¹ .	5	23 42.61	− 1.36	+ 28.32	70 21 52.98	+ 4 49.43	+ 2 49.2	7 24 9.57	− 1.71	121 35 52.8	− 5
	49	B. A. C. 2477² .	6	23 43.13	− 1 36	+ 28.32	70 21 52.98	+ 4 43.50	+ 2 49.2	7 24 10.09	− 1.71	121 35 46.9	− 5
	50	Anonymous . .	9	32 30.90	− 1.48	+ 28.32	74 53 53.20	+ 4 37.85	+ 3 42.5	7 32 57.74	− 1.74	126 8 34.7	− 5

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	30.43	30.5	26.8
9	30.40	29.0	25.3
17	30.40	28.5	24.4
19	30.37	32.5	31.0
23	30.33	39.5	41.4
26	30.32	32.6	44.6
28	30.30	47.8	45.3
30	30.28	45.8	46.1
31	30.26	40.0	37.8
45	30.24	38.0	34.5

For summary of the elements of reduction see page 3

ZENITH-POINT CORR.

1, 2. One bisection.
30. Three bisections.
27. Four bisections.

No. 1 to 17 + 55.″30
No. 18 to 30 + 52.96
No. 31 to 50 + 52.43

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' ″	' ″	' ″	' ″
20	− 4.8	+ 6.1	. .	+ 1.3
21	− 4.8	− 6.1	+ 0.1	− 10.8
22	− 6.9	+ 16 13.0	. .	+ 16 6.1
23	− 7.0	− 16 13.0	. .	− 16 20.0

Date	Number.	Object.	Threads.	Mean Thread.	Corrections. Inst.	Corrections. Clock.	Zenith Dist. South, from Circles.	Corrections. Instrument.	Corrections. Refraction.	Apparent Right Ascension.	Miscellaneous Correction.	Apparent North-Polar Distance.	Miscellaneous Correction.
77				h. m.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
. 15	1	B. A. C. 2561 .	9	38 16.93	− 1.47	+ 28.32	74 31 53.73	+ 3 43.64	+ 3 36.9	7 38 43.78	− 1.75	125 45 35.5	− 5.4
S.	2	B. A. C. 2572 .	9	39 15.11	− 1.48	+ 28.32	74 31 53.73	+ 4 29.73	+ 3 37.0	7 39 41.95	− 1.76	125 46 21.7	− 5.4
	3	λ Ursæ Min., s. p.	3	46 9.37	−55.30	+ 28.33	307 45 50.38	+ 5 1.25	− 1 17.9	19 45 42.40	− 2.66	358 55 54.9	+ 0.9
	4	B. A. C. 2685 .	9	56 42.56	− 1.52	+ 28.33	75 41 53.95	+ 4 20.22	+ 3 55.1	7 57 9.37	− 1.79	126 56 40.5	− 5.3
	5	B. A. C. 2717 .	9	59 54.00	− 1.42	+ 28.33	71 59 55.25	+ 5 16.89	+ 3 5.6	8 0 20.91	− 1.79	123 14 38.9	− 5.2
	6	B. A. C. 2719^1 .	6	0 35.10	− 1.42	+ 28.33	71 59 55.25	+ 3 52.75	+ 3 5.2	8 1 2.01	− 1.80	123 13 14.4	− 5.1
	7	B. A. C. 2719^2 .	5	0 36.81	− 1.42	+ 28.33	71 59 55.25	+ 3 50.60	+ 3 5.2	8 1 3.72	− 1.80	123 13 12.2	− 5.1
	8	Anonymous .	9	22 28.56	− 0.60	+ 28.33	31 47 49.70	+ 5 27.00	+ 37.7	8 22 56.29	− 2.09	83 0 15.6	− 1.8
	9	B. A. C. 2941 .	9	35 23.53	− 1.61	+ 28.33	78 33 51.18	+ 4 39.04	+ 4 54.2	8 35 50.25	− 1.87	129 49 45.6	− 5.1
	10	B. A. C. 2980 .	9	41 31.26	− 1.44	+ 28.33	72 55 54.13	+ 4 54.84	+ 3 16.3	8 41 58.15	− 1.86	124 10 26.5	− 5.1
	11	Lacaille 3525 .	9	42 5.79	− 1.44	+ 28.33	72 55 54.13	+ 3 31.88	+ 3 16.1	8 42 32.68	− 1.86	124 9 3.3	− 5.1
	12	B. A. C. 3081 .	9	55 5.25	− 1.63	+ 28 34	79 29 57.13	+ 4 59.64	+ 5 20.1	8 55 31.99	− 1.89	130 46 38.1	− 4.9
	13	B. A. C. 3193 .	9	15 8.38	− 1.52	+ 28.34	75 49 55.82	+ 3 27.67	+ 3 57.5	9 15 35.20	− 1.89	127 3 42.2	− 4.9
	14	α Hydræ . . .	9	21 7.21	− 0.88	+ **28.25**	46 55 52.43	+ 4 23.00	+ 1 5.1	9 21 34.77	+ 0.17	98 7 41.7	+ 2.1
	15	Uranus . . .	9	39 51.16	− 0.46	+ 28.34	24 3 52.15	+ 3 48.79	+ 27.2	9 40 19.04	. .	75 14 29.3	. .
	16	Weisse (2) 1106 .	9	53 4.46	− 0.39	+ 28 34	20 45 51.38	+ 4 36.78	+ 23.2	9 53 32.41	− 2.37	71 57 12.6	− 6.6
	17	α Leonis . . .	9	1 23.63	− 0.50	+ **28 34**	26 13 49.37	+ 5 22.37	+ 30.1	10 1 51.47	− 0.04	77 26 3.0	+ 0.4
	18	B. A. C. 3194 .	9	7 33.96	− 1.40	+ 28.35	71 11 53.13	+ 4 25.03	+ 2 57.6	10 8 0.91	− 1.87	122 25 37.0	− 5.0
	19	γ^1 Leonis . .	9	12 45.68	− 0.34	+ **28.44**	18 19 53.60	+ 5 46.56	+ 20.3	10 13 13.69	− 0.07	69 32 21.7	+ 1.7
	20	B. A. C. 3742^1 (R.)	.	. . .	. .	. .	166 25 51.82	+ 4 51.37	− 14.6	. . . .	. .	64 35 52.6	−10.8
	21	B. A. C. 3742^1 .	.	. . .	. .	. .	13 23 47.40	+ 5 26.36	+ 14.6	. . . .	. .	64 35 49.6	−10.8
P.	22	γ Draconis (R.) .	.	. . .	. .	. .	192 31 52.12	+ 4 4.49	+ 13.5	. . . .	. .	38 30 11.1	− 0.6
	23	γ Draconis . .	.	. . .	. .	. .	347 19 57.08	+ 4 8.05	− 13.5	. . . .	. .	38 30 12.8	+ 1.1
	24	δ Ursæ Minoris .	8	10 57.54	+16 02	+ 28.16	312 13 52.80	+ 4 46.74	− 1 6.2	18 11 41.72	− 0.11	3 23 54.5	− 0.3
	25	ι Aquilæ . . .	9	28 3.64	− 0.88	+ **28.08**	47 7 53.78	+ 4 35.15	+ 1 5.0	18 28 30.92	+ 0.16	98 19 55.1	+ 1.2
	26	α Lyræ. . . .	9	32 17.47	+ 0.10	+ **28 25**	0 9 51.05	+ 3 57.06	+ 0.2	18 32 45.73	− 0.06	51 20 9.5	+ 0.1
	27	β Lyræ. . . .	9	45 3.66	− 0.07	+ **28.15**	5 35 49.70	+ 4 48.93	+ 6.0	18 45 31.75	+ 0.02	56 47 5.8	+ 0.6
	28	ζ Aquilæ . . .	9	59 17.42	− 0.48	+ **28 17**	25 7 53.10	+ 4 40.42	+ 28.3	18 59 45.10	+ 0.10	76 19 23.0	+ 2.4
	29	δ Draconis (R.) .	.	. . .	. .	. .	208 27 49.52	+ 4 23.09	+ 32.6	. . . .	. .	22 33 36.0	− 2.3
	30	δ Draconis. . .	3	11 58.34	+ 1.71	+ 28.17	331 23 52.25	+ 3 58.14	− 32.6	19 12 28.22	− 0.04	22 33 39.0	+ 0.7
	31	B. A. C. 6690 (R.)	.	. . .	. .	. .	168.43 50.70	+ 4 32.94	− 11.8	. . . .	. .	62 18 9.4	−17.6
	32	B. A. C. 6690 .	.	. . .	. .	. .	11 5 51.72	+ 5 44.05	+ 11.8	. . . .	. .	62 18 8.8	−17.6
	33	ε Draconis . .	5	48 0.71	+ 2 04	+ 28.17	328 51 52.97	+ 5 22.79	− 35.9	19 48 30.92	+ 0.24	20 3 1.1	− 0.2
	34	γ Cygni . . .	9	17 19.26	+ 0.13	+ 28.18	358 57 51.65	+ 4 15.25	− 1.0	20 17 47.57	+ 1.27	50 8 27.1	−14.2
	35	Venus I, N. . .	6	42 34.47	− 1.07	+ 28.18	57 39 54.45	+ 5 1.58	+ 1 33.5	20 43 1.58	+ 0.35	108 52 50.7	. .
	36	Venus II, S. .	5	42 35.21	− 1.07	+ 28.18	57 39 54.45	+ 5 11.06	+ 1 33.6	20 43 2.32	− 0.39	108 53 0.3	. .
16	37	γ Aquilæ . . .	9	39 56.48	− 0.56	+ **28 42**	28 29 50.87	+ 4 37.46	+ 32.9	19 40 24.32	+ 0.01	79 41 22.4	+ 1.9
E.	38	α Aquilæ . . .	9	44 18.73	− 0.59	+ **28.40**	30 15 53.77	+ 4 42.40	+ 35.3	19 44 46.54	+ 0.04	81 27 32.7	+ 0.7
	39	Mercury II, C. .	9	19 0.52	− 1.12	+ 28.42	57 45 52.18	+ 3 30.69	+ 1 35 4	20 19 27.82	− 0.26	108 57 19.5	. .
	40	α Cygni . . .	9	36 44.11	+ 0.30	+ **28.40**	353 57 48.20	+ 5 40.04	− 6.3	20 37 12.83	+ 0.06	45 9 44.0	+ 0.9
	41	Venus II, N. .	9	47 42.14	− 1.11	+ 28.43	57 23 50.62	+ 3 36.56	+ 1 33.9	20 48 9 46	− 0.38	108 35 22.3	. .
	42	Venus, S. . .	.	. . .	. .	. .	57 23 50.62	+ 3 43.30	+ 1 33.9	. . . .	.	108 35 29.0	. .
17	43	Sun I, N. . .	9	3 48.58	− 0.97	+ 28.46	50 17 54.05	+ 3 44.88	+ 1 12.0	22 4 16.07	+66.45	101 29 12.1	. .
	44	Sun II, S. . .	9	6 1.47	− 0.97	+ 28.46	50 49 57.17	+ 4 6.87	+ 1 12.6	22 6 28.96	−66.44	102 1 37.8	. .
	45	α Andromedæ .	9	1 32.82	− 0.20	+ **28 60**	10 23 45.80	+ 4 57.63	+ 11.0	0 2 1.13	− 0.06	61 35 15.6	+ 1.4
	46	γ Pegasi . . .	9	6 25.75	− 0.49	+ **28 52**	24 17 49.22	+ 5 24.27	+ 26.9	0 6 53.77	0.00	75 30 1.6	+ 2.8
	47	β Ceti	6	36 57.58	− 1.12	+ **28.43**	57 27 40.35	+ 4 4.01	+ 1 33.1	0 37 24 99	+ 0.16	108 39 47.7	+ 0.7
	48	β Andromedæ .	9	2 21.89	− 0.03	+ 28.54	3 51 47.75	+ 3 33.00	+ 4.1	1 2 50.40	+ 0.56	55 1 46.1	+10.0
	49	Moon I, S. . .	9	4 28.59	− 0.58	+ 28.54	28 53 49.63	+ 4 49.05	+ 32.9	1 4 56.55	+64.00	80 5 33.7	. .
	50	Polaris . . .	7	11 38.18	+42.89	+ 28.54	310 9 50.95	+ 5 23.80	− 1 10.1	1 12 49 61	+ 0.41	1 20 25.9	+ 0.4

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.22	37.2	34.5
30.20	36.0	33.0
30.19	35.2	32.5
. .	. .	32.2
30.11	35.7	34.4
30.12	36.4	5.5
30.12	38.9	38.2
30.11	42.5	42.1
30.11	44.1	44.2
29.96	34.0	32.8
29.92	37.2	36.7
29.92	42.0	40.0
29.91	40.0	38.7

For summary of the elements of reduction see page 3.

6, 31, 32, 46. One bisection.
49, 50. Three bisections.
26, 28, 39. Four bisections.

ZENITH-POINT CORR.

No. 1 to 21 + 52″.43
No. 22 to 36 + 53.94
No. 37 to 50 + 53.83

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
15	− 0.2	. .	. .	− 0.2
35	− 4.7	+ 4.8	. .	+ 0.1
36	− 4.7	− 4.8	0.0	− 9.5
39	− 8.2	. .	+ 0.3	− 7.9
41	− 4.7	+ 3.4	. .	− 1.3
42	− 4.7	− 3.4	+ 0.1	− 8.0
43	− 6.8	+ 16 12.8	. .	+ 16 6.0
44	− 6.9	− 16 12.8	. .	− 16 19.7
49	− 26 50.4	− 15 13.7	. .	− 42 4.1

DATE AND OBS'R.	Number.	OBJECT.	Thread.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Feb. 17 E.	1	Weisse (2) 1090	9	35 9.66	+ 0.03	+ 28.72	0 39 53.63	+ 2 9.42	+ 0.7	5 35 38.41	− 1.77	51 48 24.9	+14
	2	Weisse (2) 1103	9	35 21.01	+ 0.03	+ 28.72	0 39 53.63	+ 1 4.80	+ 0.7	5 35 49.76	− 1.77	5 42 20.3	+14
	3	Durch. 38°, 1273	8	37 23.30	+ 0.03	+ 28.72	0 39 53.63	+ 8 13.05	+ 0.8	5 37 52.05	− 1.79	51 54 28.7	+14
	4	Weisse (2) 1235	8	38 40.66	+ 0.03	+ 28.72	0 39 53.63	+ 6 11.74	+ 0.8	5 39 9.41	− 1.80	51 52 27.4	+14
	5	Yarnall 2456	5	50 27.30	− 1.40	+ 28.72	68 43 54.50	+ 3 36.90	+ 2 34.4	5 50 54.62	− 1.37	119 56 27.0	− 5
	6	Yarnall 2455	4	50 29.20	− 1.40	+ 28.72	68 43 54.50	+ 6 30.73	+ 2 34.8	5 50 56.52	− 1.37	119 59 21.2	− 5
	7	Weisse (2) 1913	9	59 18.73	+ 0.03	+ 28.72	0 51 50.60	+ 1 55.03	+ 0.9	5 59 47.48	− 2.04	52 0 7.7	+13
	8	Durch. 31°, 121[illegible]	9	2 0.64	− 0.15	+ 28.72	7 23 45.23	+ 3 4.52	+ 7.9	6 2 29.91	− 1.86	58 33 18.8	+11
	9	Durch. 31°, 122	3	2 17.35	− 0.15	+ 28.72	7 23 45.23	+ 8 42.38	+ 8.0	6 2 45.92	− 1.86	58 38 56.8	+11
	10	δ Ursæ Min., S. P.	5	11 31.12	−17.60	+ 28.72	305 27 47.55	+ 3 23.42	− 1 24.4	18 11 42.24	− 0.06	356 36 7.8	+ 2
	11	μ Geminorum	9	15 4.59	− 0.35	**+ 28 74**	16 13 16.67	+ 4 58.29	+ 17.7	6 15 32.96	− 0.04	67 25 23.9	+ 1
	12	O. Arg. S. 5133	9	21 48.24	− 1.30	+ 28.72	64 33 49.27	+ 4 34.72	+ 2 6.9	6 22 15.66	− 1.50	115 46 52.1	− 4
	13	O. Arg. S. 5144	3	22 17.81	− 1.30	+ 28.72	64 33 49.27	+ 6 57.69	+ 2 7.1	6 22 45.23	− 1.50	115 49 15.3	− 4
	14	O. Arg. S. 5176	9	23 44.11	− 1.30	+ 28.72	64 33 49.27	+ 6 8.74	+ 2 7.0	6 24 11.53	− 1.50	115 48 26.2	− 4
	15	O. Arg. S. 5198	5	24 41.74	− 1.30	+ 28.72	64 33 49.27	+ 5 54.16	+ 2 7.0	6 25 9.16	− 1.51	115 48 11.6	− 4
	16	O. Arg. S. 5199	5	24 42.70	− 1.30	+ 28.72	64 33 49.27	+ 6 12.62	+ 2 7.0	6 25 10.12	− 1.51	115 48 30.1	− 4
	17	γ Geminorum	9	30 9.91	− 0.47	**+ 28.74**	22 17 47.97	+ 5 13.57	+ 0 24.9	6 30 38.16	− 0.05	73 29 47.6	+ 2
	18	α Canis Majoris	.	. . .	. .	. .	55 19 55.95	+ 5 19.18	+ 1 27.4	. . . .	. .	106 33 3.7	+ 3
	19	51 Cephei	3	41 54.24	−20.00	+ 28.72	311 35 47.55	+ 4 41.23	− 1 7.8	6 42 42.96	− 0.23	2 45 42.2	+ 0
	20	ε Canis Majoris	9	53 21.83	− 1.37	**+ 28.68**	67 35 50.50	+ 3 50.36	+ 2 26.2	6 53 49.18	− 0.01	118 48 28.3	+ 2
	21	B. A. C. 2743	9	4 5.71	− 1.55	+ 28.71	73 51 51.48	+ 4 9.70	+ 3 28.1	8 4 32.87	− 1.79	125 5 50.5	− 5
	22	B. A. C. 2758	9	6 3.67	− 1.60	+ 28.71	75 41 50.42	+ 3 39.04	+ 3 55.2	8 6 30.78	− 1.80	126 55 45.9	− 5
	23	B. A. C. 2794	9	13 10.39	− 1.55	+ 28.71	73 49 52.83	+ 4 32.88	+ 3 27.8	8 13 37.46	− 1.81	125 4 14.7	− 5
	24	B. A. C. 2809	9	16 31.81	− 1.67	+ 28.71	77 57 50.17	+ 5 0.48	+ 4 40.3	8 16 58.85	− 1.82	129 13 52.1	− 5
	25	Anonymous	6	21 5.10	− 0.66	+ 28.71	31 33 51.48	+ 4 53.58	+ 0 37.5	8 21 33.15	− 2.09	82 45 43.8	− 1
	26	B. A. C. 3163	9	10 20.64	− 1.63	+ 28.71	76 47 48.60	+ 5 9.21	+ 4 16.3	9 10 47.72	− 1.89	128 3 35.3	− 5
	27	B. A. C. 3193	9	15 8.04	− 1.61	+ 28.71	75 49 55.35	+ 3 25.61	+ 3 58.2	9 15 35.14	− 1.89	127 3 40.4	− 5
	28	α Hydræ	9	21 6.84	− 0.94	**+ 28.69**	46 55 49.15	+ 4 26.03	+ 1 5.3	9 21 34.61	0.00	98 7 41.7	+ 1
	29	B. A. C. 3254¹	8	25 4.29	− 1.43	+ 28.71	70 5 52.90	+ 6 5.31	+ 2 47.8	9 25 31.57	− 1.89	121 21 7.2	− 5
	30	B. A. C. 3254²	8	25 4.75	− 1.43	+ 28.71	70 5 52.90	+ 5 59.51	+ 2 47.8	9 25 32.03	− 1.89	121 21 1.4	− 5
	31	B. A. C. 3262	8	25 51.08	− 1.43	+ 28.71	70 5 52.90	+ 4 53.15	+ 2 47.6	9 26 18.36	− 1.89	121 19 54.8	− 5
	32	Atala	6	34 7.09	− 0.11	+ 28.70	5 31 45.67	+ 6 37.49	+ 0 6.0	9 34 35.68	. .	56 44 50.4	− 0
	33	Uranus I, C.	6	39 30.32	− 0.52	+ 28.70	24 1 51.17	+ 4 8.93	+ 0 27.3	9 39 58.50	+ 0.18	75 12 48.6	.
	34	Uranus II	5	39 30.68	− 0.52	+ 28.70	24 2 . .	. . .	. .	9 39 58.86	− 0.18	. . . .	.
	35	μ Leonis	9	45 20.13	− 0.28	**+ 28.67**	12 13 47.60	+ 4 36.20	+ 0 13.3	9 45 48.55	+ 0.07	63 24 58.3	+ 0
	36	Weisse (2) 1158	6	55 10.04	− 0.48	+ 28.70	21 47 50.70	+ 3 53.06	+ 0 24.5	9 55 38.26	− 2.37	72 58 29.5	− 6
	37	Hecate	8	0 54.03	− 0.51	+ 28.70	23 27 47.77	+ 7 24.92	+ 0 26.7	10 1 22.22	. .	74 42 0.6	− 1
	38	Weisse (2) 231	6	12 30.43	− 0.40	+ 28.70	18 19 54.17	+ 4 18.17	+ 0 20.3	10 12 58.73	− 2.43	69 32 53.8	− 8
	39	γ¹ Leonis	8	12 45.45	− 0.40	**+ 28.75**	18 19 54.17	+ 5 46.88	+ 0 20.3	10 13 13.75	− 0.03	69 32 22.6	+ 2
	40	γ² Leonis	3	12 45.67	− 0.40	+ 28.70	18 19 54.17	+ 5 48.12	+ 0 20.3	10 13 13.97	− 2.43	69 32 23.8	− 8.
19 S.	41	51 Cephei	5	42 52.10	+21.30	− 30.71	311 35 47.55	+ 4 40.22	− 1 7.3	6 42 42.69	+ 0.14	2 45 41.7	+ 0.
	42	ε Canis Majoris	9	54 21.18	− 1.34	**− 30.72**	67 35 53.98	+ 3 48.41	+ 2 25.1	6 53 49.13	− 0.04	118 48 28.7	+ 2.
	43	δ Canis Majoris	9	3 57.04	− 1.28	**− 30.73**	64 59 53.93	+ 3 40.22	+ 2 8.4	7 3 25.06	− 0.02	116 12 3.8	+ 3.
	44	δ Geminorum	9	13 19.61	− 0.29	**− 30.66**	16 35 51.90	+ 4 59.05	+ 18.0	7 12 48.62	− 0.08	67 47 30.2	+ 1.
	45	B. A. C. 2609 (R.)	.	. . .	. .	. .	188 53 48.62	+ 5 24.84	+ 9.5	. . . .	. .	42 6 58.2	+ 8.
	46	B. A. C. 2609	.	. . .	. .	. .	350 55 49.88	+ 4 58.08	− 9.5	. . . .	. .	42 6 59.7	+ 8.
	47	B. A. C. 2794	9	14 9.69	− 1.51	− 30.68	73 49 56.33	+ 4 32.12	+ 3 25.6	8 13 37.50	− 1.79	125 4 15.2	− 6.
	48	η Cancri (R.)	.	. . .	. .	. .	161 53 51.05	+ 4 16.99	− 19.6	. . . .	. .	69 8 32.8	0.0
	49	η Cancri	.	. . .	. .	. .	17 57 51.15	+ 4 1.93	+ 19.6	. . . .	. .	69 8 33.9	0.0
	50	B. A. C. 3094	9	57 57.90	− 1.64	− 30.67	77 39 55.75	+ 4 27.70	+ 4 31.0	8 57 25.59	− 1.87	128 55 15.6	− 6.

No.	Barom.	At. Ther.	Ex. Ther
	in.	°	°
1	29.97	34.0	33.0
38	30.02	30.0	28.0
41	29.78	35.0	32.5
49	29.82	33.8	32.0

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

5, 6, 8, 9, 15, 16, 29, 30. One bisection.
10, 41. Three bisections. No. 1 to 40 + 55.″23
No. 41 to 50 + 54.17

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
33	− 0.2	. .	. .	− 0.2

E) R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH-DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
7.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h m. s.	s.	° ′ ″	″
19	1	B. A. C. 3158	9	10 37.03	− 1.59	− 30.67	75 51 53.85	+ 3 26.19	+ 3 56.2	9 10 4.77	− 1.88	127 5 37.4	− 6.1
	2	B. A. C. 3193	9	16 7.44	− 1.59	− 30.67	75 49 57.48	+ 3 28.13	+ 3 55.8	9 15 35.18	− 1.88	127 3 42.6	− 6.0
	3	Atala	9	33 19.14	− 0.03	− 30.66	5 29 50.87	+ 5 51.14	+ 5.9	9 32 48.45	. .	56 42 9.1	− 0.4
	4	Uranus	9	40 9.47	− 0.45	− 30.66	23 59 53.93	+ 4 25.38	+ 27.0	9 39 38.36	. .	75 11 7.5	. .
	5	μ Leonis	9	46 19.44	− 0.20	− **30.70**	12 13 50.02	+ 4 34.26	+ 13.2	9 45 48.58	+ 0.08	63 24 58.7	+ 0.9
	6	Hecate	9	0 22.87	− 0.44	− 30.65	23 17 49.88	+ 6 54.80	+ 26.2	9 59 51.78	. .	74 31 32.1	− 1.4
	7	Weisse (2) 234	7	13 29.69	− 0.33	− 30.65	18 20	. . . .	. .	10 12 58.71	− 2.45	. . . .	. .
	8	γ¹ Leonis	8	13 44.76	− 0.33	− **30.61**	18 20	. . . .	. .	10 13 13.78	− 0.02	. . . .	. .
20	9	α Andromedæ	9	2 32.32	− 0.18	− **30.94**	10 24	. . . .	. .	0 2 1.22	+ 0.05	. . . .	. .
	10	γ Pegasi	9	7 25.14	− 0.48	− **30.89**	24 18	. . . .	. .	0 6 53.74	− 0.02	. . . .	. .
	11	β Ceti	9	37 56.88	− 1.10	− **30.91**	57 28	. . . .	. .	0 37 24.88	+ 0.07	. . . .	. .
	12	Polaris	5	12 34.53	+42.82	− 30.88	310 10	. . . .	. .	1 12 46.47	− 0.96	. . . .	. .
	13	Moon I, S.	9	44 4.82	− 0.31	− 30.76	14 9 51.90	+ 4 39.26	+ 15.2	3 43 33.75	+72.69	65 20 37.6	. .
	14	γ Tauri	9	13 19.87	− 0.49	− **30.76**	23 27 52.72	+ 5 30.01	+ 26.1	4 12 48.61	+ 0.01	74 40 10.0	+ 3.7
	15	62¹ Tauri	6	17 4.95	− 0.32	− 30.77	14 47 52.63	+ 4 24.59	+ 15.9	4 16 33.86	− 0.96	65 58 54.3	+11.6
	16	62² Tauri	5	17 6.94	− 0.32	− 30.77	14 47 52.63	+ 4 35.07	+ 15.9	4 16 35.85	− 0.96	65 59 4.8	+11.6
	17	ε Tauri	9	21 58.32	− 0.42	− **30.78**	19 53 53.87	+ 4 54.42	+ 21.8	4 21 27.13	+ 0.02	71 5 31.3	+ 3.4
	18	α Tauri	9	29 24.14	− 0.47	− **30.81**	22 34	. . . .	. .	4 28 52.90	+ 0.03	. . . .	. .
	19	B. A. C. 1418	9	37 52.23	+ 5.53	− 30.78	317 51 51.75	+ 3 12.92	− 54.1	4 37 26.98	− 2.91	9 0 31.8	+27.8
	20	9 Camelopard.	9	42 21.07	+ 1.51	− 30.78	332 41 54.58	+ 4 2.03	− 30.9	4 41 51.80	+ 0.25	23 51 46.9	+ 2.3
	21	ι Aurigæ	9	49 31.27	− 0.10	− **30.80**	5 49 55.57	+ 5 14.23	+ 6.2	4 49 0.39	+ 0.04	57 1 27.2	+ 1.9
	22	Lalande 9484	9	57 28.99	− 0.24	− 30.79	11 17 53.30	+ 4 2.01	+ 12.1	4 56 57.96	− 1.28	62 28 28.6	+12.3
	23	ε Ursæ Min., S. P.	5	59 14.22	− 8.09	− 30.79	301 5 52.63	+ 3 9.64	− 1 39.1	16 58 35.34	+ 0.09	352 13 44.4	+ 1.6
	24	α Aurigæ (R.)	.	. . .	. .	. .	186 53 50.58	+ 4 55.92	+ 7.4	. . . .	. .	44 7 27.3	− 0.6
	25	α Aurigæ	3	8 8.33	+ 0.31	− **30.77**	352 57 56.00	+ 3 21.04	− 7.4	5 7 37.85	− 0.03	44 7 30.8	+ 2.9
	26	β Tauri (R.)	.	. . .	. .	. .	169 31 48.75	+ 5 0.59	− 11.0	. . . .	. .	61 29 42.9	+ 0.6
	27	β Tauri	2	19 3.44	− 0.19	− **30.76**	10 17 52.48	+ 5 18.70	+ 11.0	5 18 32.46	− 0.02	61 29 43.4	+ 1.1
	28	B. A. C. 1662	5	23 14.09	+11.11	− 30.79	313 41 53.85	+ 4 40.22	− 1 2.7	5 22 54.41	− 9.12	4 51 52.6	+27.0
	29	B. A. C. 1767 (R.)	.	. . .	. .	. .	162 5 50.02	+ 4 55.54	− 19.4	. . . .	. .	68 55 55.0	+ 9.2
	30	B. A. C. 1767	.	. . .	. .	. .	17 43 53.15	+ 5 22.18	+ 19.4	. . . .	. .	68 55 55.9	+ 9.2
	31	B. A. C. 1849 (R.)	.	. . .	. .	. .	200 53 53.30	+ 3 54.08	+ 23.1	. . . .	. .	30 8 10.7	+20.6
	32	B. A. C. 1849	5	44 29.11	+ 0.91	− 30.80	338 57 54.75	+ 4 22.07	− 23.1	5 43 59.22	− 2.48	30 8 14.9	+20.6
	33	22 Camelopard.	5	5 49.93	+ 1.95	− 30.81	329 27 54.87	+ 4 25.51	− 35.5	6 5 21.07	+ 0.22	20 38 6.1	+ 2.2
	34	δ Ursæ Min., S. P.	5	12 32.24	−17.76	− 30.81	305 27 52.87	+ 3 16.64	− 1 24.3	18 11 43.67	+ 0.50	356 36 6.4	+ 1.9
	35	B. A. C. 2147	9	28 36.68	− 1.42	− 30.82	70 43 57.08	+ 3 21.75	+ 2 51.6	6 28 4.44	− 1.46	121 56 31.6	− 6.0
	36	Yarnall 2790	9	49 8.54	− 1.23	− 30.82	63 1 53.48	+ 3 55.79	+ 1 58.5	6 48 36.49	− 1.55	114 14 9.0	− 4.8
	37	Tolosa	9	26 23.80	− 0.42	− 30.90	23 37 54.58	+ 7 22.31	+ 26.8	10 25 52.48	. .	74 52 4.9	− 1.9
	38	B. A. C. 3763	9	53 59.81	− 1.44	− 30.91	71 51 54.15	+ 3 24.00	+ 3 4.1	10 53 27.46	− 1.88	123 4 43.5	− 6.4
	39	B. A. C. 3906	9	23 43.69	+ 6.64	− 30.92	317 1 55.52	+ 4 36.66	− 56.3	11 23 19.41	−13.74	8 11 57.4	−11.5
	40	B. A. C. 8213, S. P.	5	28 9.74	−18.38	− 30.92	305 27 52.92	+ 5 5.45	− 1 24.7	23 27 20.44	+30.35	356 37 54.9	−10.6
	41	β Leonis (R.)	.	. . .	. .	. .	156 17 50.80	+ 4 16.91	− 26.5	. . . .	. .	74 44 40.0	+ 1.7
	42	β Leonis	2	43 20.60	− 0.41	− **30.90**	23 33 53.40	+ 3 58.67	+ 26.5	11 42 49.27	− 0.03	74 44 39.8	+ 1.6
	43	γ Ursæ Maj. (R.)	.	. . .	. .	. .	195 23 51.63	+ 4 39.49	+ 16.8	. . . .	. .	35 37 33.3	+ 0.3
	44	γ Ursæ Maj.	.	. . .	. .	. .	344 27 55.65	+ 3 33.62	− 16.8	. . . .	. .	35 37 33.7	+ 0.7
	45	ο Virginis (R.)	.	. . .	. .	. .	150 27 55.30	+ 3 43.43	− 34.2	. . . .	. .	80 35 16.7	+ 1.8
	46	ο Virginis	.	. . .	. .	. .	29 23 54.22	+ 4 26.90	+ 34.2	. . . .	. .	80 35 16.5	+ 1.6
	47	4 Draconis (R.)	.	. . .	. .	. .	219 19 52.10	+ 3 22.84	+ 49.7	. . . .	. .	11 42 16.6	− 2.6
	48	4 Draconis	6	7 0.49	+ 4.46	− 30.93	320 31 55.20	+ 4 51.33	− 49.7	12 6 34.02	− 0.23	11 42 18.0	− 1.2
	49	B. A. C. 4165	3	15 11.38	+36.73	− 30.94	310 27 51.50	+ 4 19.14	− 1 11.3	12 15 17.17	−58.90	1 37 23.5	−16.7
	50	β Corvi	9	28 29.54	− 1.16	− **30.94**	61 20 56.20	+ 4 59.84	+ 1 51.3	12 27 57.44	+ 0.01	112 43 23.5	+ 2.6

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.88	31.2	29.3
29.99	37.5	37.3
29.99	37.3	36.5
29.96	35.2	33.5
29.96	34.2	32.3
29.91	31.2	2.86
29.90	31.3	29.4
29.90	31.3	29.4
29.89	31.8	30.5

For summary of the elements of reduction see page 3.

45, 46. One bisection.
28, 34, 40. Three bisections.
17, 21. Four bisections.
13. Five bisections.

8. Bar. read at 10ʰ 44ᵐ.

ZENITH-POINT CORR.

No. 1 to 6 + 54.″17
No. 13 to 50 + 53.77

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	− 0.2	. .	. .	− 0.2
13	− 14 1.5	− 15 47.5	. .	− 29 49.0

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
1877. Feb. 20	1	21 Cassiopeæ, s. p.	9	38 4.01	− 4.43	− 30.94	293 9 52.05	+ 5 18.26	− 2 19.8	0 37 28.64	+ 0.18	344 19 11.7	+ 2
P.	2	12² Canum Venat. .	6	50 49.52	+ 0 19	− **30.90**	359 49 54.55	+ 5 6.94	− 0.1	12 50 18.76	− 0.02	51 1 22.6	+ 1
	3	B. A. C. 262, s. p.	4	52 42.75	−14.39	− 30.95	304 25 50.70	+ 5 21.39	− 1 27.7	12 51 57.41	+17.99	355 36 5.6	−19
	4	B. A. C. 4389 .	9	0 53.21	+ 0.45	− 30.95	352 53 53.95	+ 4 38.37	− 7.4	13 0 22.71	− 2.65	44 4 46.1	−22
	5	ο Virginis . . .	9	4 8.41	− 0.78	− **30.98**	43 41 57.20	+ 3 53.11	+ 57.8	13 3 36.68	− 0.01	94 53 9.3	+ 1
	6	Polaris, s. p. .	5	14 3.13	−46.08	− 30.96	307 29 54.25	+ 4 37.44	− 1 18.4	1 12 46.09	+ 1.05	358 39 34.5	+ 0
	7	α Virginis . . .	9	19 16.39	− 0.90	− **31.00**	49 19 55.97	+ 3 53.23	+ 1 10.4	13 18 41.53	+ 0.01	100 31 20.8	+ 1
	8	38 Cassiopeæ, s. p.	9	22 37.93	− 3.50	− 30.96	288 29 53.40	+ 4 53.33	− 2 58.1	1 22 3.47	+ 0.03	339 38 9.8	0
	9	B. A. C. 4545 .	9	30 32.80	+ 0.40	− 30.96	353 59 56.80	+ 4 37.88	− 6.3	13 30 2.24	− 2.36	45 10 49.6	−24
	10	B. A. C. 4562 .	5	35 21.10	− 0.28	− 30.96	18 9 54.68	+ 9 2.68	+ 20.0	13 34 49.86	− 1.81	69 25 38.6	−20
	11	B. A. C. 4563 .	6	35 21.53	− 0.27	− 30.96	18 9 54.68	+ 5 34.81	+ 20.0	13 34 50.30	− 1.81	69 22 10.7	−20
E.	12	δ Aquilæ . . .	9	19 49.26	− 0.79	− **30.81**	35 55 51.55	+ 5 3.17	+ 43.0	19 19 17.71	+ 0.12	87 7 58.9	+ 1
	13	B. A. C. 6690 .	9	26 16.07	− 0.30	− 30.76	11 7 50.63	+ 3 47.29	+ 11.7	19 25 45.01	+ 0.56	62 18 10.8	−18
	14	γ Aquilæ . . .	9	40 55.81	− 0.65	− **30.74**	28 29 51.25	+ 4 38.25	+ 32.1	19 40 24.39	0.00	79 41 22.8	+ 1
	15	α Aquilæ . . .	9	45 18.06	− 0.69	− **30.75**	30 15 50.02	+ 4 47.20	+ 34.5	19 44 46.60	+ 0.02	81 27 32.9	+ 0
	16	α Cygni (r.) . .	.	. . .	. .	. .	185 51 47.70	+ 4 43.37	+ 6.1	. . . .	. .	45 9 44.0	− 0
	17	α Cygni . . .	.	. . .	. .	. .	353 57 50.18	+ 5 39.73	− 6.1	. . . .	. .	45 9 45.0	+ 0
	18	Venus II, N. .	9	8 58.71	− 1.13	− 30.80	56 7 52.15	+ 4 21.17	+ 1 27.2	21 8 26.78	− 0.38	107 20 1.7	.
	19	Venus, S. . .	.	. . .	. .	. .	56 7 52.15	+ 4 32.65	+ 1 27.1	. . . .	. .	107 20 13.1	.
21	20	Sun I, S. . .	9	20 9.12	− 0.98	− 30.82	49 23 54.42	+ 4 22 37	+ 1 7.8	22 19 37.32	+66.07	100 35 45.8	.
	21	Sun II, N. . .	9	22 21.26	− 0.98	− 30.82	48 51 51.30	+ 3 58.79	+ 1 6.6	22 21 49.46	−66.07	100 3 17.9	.
	22	α Andromedæ . .	9	2 32.21	− 0.19	− **30.82**	10 23 50.52	+ 4 54.79	+ 10.6	0 2 1.16	− 0.01	61 35 17.1	+ 2
	23	γ Pegasi . . .	9	7 25.10	− 0.49	− **30.84**	24 17 47.55	+ 5 27.23	+ 26.0	0 6 53.75	− 0.01	75 30 2.0	+ 2
	24	β Ceti	9	37 56.91	− 1.11	− **30.94**	57 27 47.93	+ 4 9.21	+ 1 29 7	0 37 24.93	+ 0.13	108 39 48.0	+ 1
	25	β Andromedæ .	9	3 21.20	− 0.01	− 30.88	3 51 48.62	+ 3 33.55	+ 3.9	1 2 50.31	+ 0.60	55 1 47.3	+ 9
	26	Polaris . . .	5	12 33.51	+46.21	− 30.88	310 9 52.00	+ 5 20.44	− 1 7.3	1 12 48.84	+ 1.99	1 20 26.3	0
	27	θ¹ Ceti	9	18 24.43	− 0.91	− **30.94**	47 38 . .	. .	. .	1 17 52 63	+ 0.05	. . . .	.
	28	η Piscium . . .	9	25 25.43	− 0 47	− **30 88**	24 5 50.40	+ 4 40 43	+ 25.6	1 24 54.07	+ 0.07	75 17 17.6	+ 3
	29	β Arietis . . .	9	48 21.98	− 0.35	− **30.83**	18 35 49.42	+ 5 4.64	+ 19.2	1 47 50.73	− 0.05	69 47 34.5	+ 4
	30	α Arietis (r.) . .	.	. . .	. .	. .	163 55 49.10	+ 3 44.62	− 16.4	. . . .	. .	67 7 3.9	+ 1
	31	α Arietis . . .	.	. . .	. .	. .	15 55 47.65	+ 4 39.10	+ 16.4	. . . .	. .	67 7 4.3	+ 1
	32	α Tauri . . .	9	29 24.06	− 0.45	− **30.77**	22 33 46.65	+ 3 44.12	+ 24.1	4 28 52.73	− 0.12	73 44 16.1	+ 3
	33	9 Camelop. . .	9	42 20.94	+ 1.67	− 30.89	332 41 51.13	+ 4 4.37	− 29.8	4 41 51.72	+ 0.21	23 51 46.9	+ 2
	34	Moon I, S. . .	9	46 31.49	− 0.22	− 30.89	11 33 49.32	+ 3 34.37	+ 11.9	4 46 0.38	+75.62	62 43 56.8	.
	35	11 Orionis (r.) . .	.	. . .	. .	. .	156 15 46.65	+ 4 59.69	− 25.4	. . . .	. .	74 46 0.3	+ 0
	36	11 Orionis . . .	.	. . .	. .	. .	23 33 48.10	+ 5 26.47	+ 25.4	. . . .	. .	74 46 1.2	+ 1
	37	β Orionis . . .	9	9 10.68	− 0.92	− **30 98**	47 7 48.22	+ 5 34.29	+ 1 2.7	5 8 38.87	+ 0.09	98 20 46.4	+ 3
	38	B. A. C. 1619 .	9	11 1.44	− 3.67	− 30.89	320 59 51.55	+ 2 38.08	− 46.9	5 10 26.88	− 3.60	12 7 3.9	+26
	39	β Tauri . . .	9	19 3.51	− 0.19	− **30.85**	10 17 46.55	+ 5 25.80	+ 10.7	5 18 32.43	− 0.03	61 29 44.3	+ 2
	40	Lacaille 1855 .	9	23 49.72	− 1.44	− 30.88	71 15 47.17	+ 6 19.37	+ 2 50.8	5 23 17.40	− 1.17	122 31 18.5	− 6
	41	δ Orionis . . .	9	26 16.37	− 0.78	− **30.92**	39 11 51.17	+ 4 31.19	+ 47.6	5 25 44.71	+ 0.01	90 23 31.2	+ 2
	42	Weisse (2) 1090.	8	36 9.14	+ 0.07	− 30.88	0 39 51.22	+ 2 10.32	+ 0.7	5 35 38.33	− 1.70	51 48 23.4	+14
	43	Weisse (2) 1103.	8	36 20.55	+ 0.07	− 30.88	0 39 51.22	+ 1 4.02	+ 0.7	5 35 49.74	− 1.70	51 47 17.1	+14
	44	Durch. 38°, 1283	9	38 22.77	+ 0.07	− 30.88	0 39 51.22	+ 8 14.39	+ 0.8	5 37 51.96	− 1.72	51 51 27.6	+14
	45	Weisse (2) 1235.	9	39 40.17	+ 0.05	− 30.88	0 39 51.22	+ 6 11.89	+ 0 8	5 39 9.34	− 1.73	51 52 25.1	+14
	46	Yarnall 2456 .	6	51 26.84	− 1.40	− 30.83	68 43 51.30	+ 3 45.90	+ 2 29.4	5 50 54.56	− 1.30	119 56 27.8	− 5
	47	Yarnall 2455 .	5	51 28.59	− 1.40	− 30.88	68 43 51.30	+ 6 39.72	+ 2 29.7	5 50 56.31	− 1.30	119 59 21.9	− 5
	48	Weisse (2) 1913	9	0 18.09	− 0.05	− 30.87	0 51 51.17	+ 1 53.27	+ 0.9	5 59 47.17	− 1.90	52 0 6.5	+15
	49	δ Ursæ Min., s. p.	8	12 33.02	−18.70	− 30.87	305 27 49.52	+ 3 16.83	− 1 21.8	18 11 43.45	+ 0.01	356 36 5.8	+ 1
	50	Lalande 12148¹.	9	16 12.63	− 0.44	− 30.87	21 11 48.08	+ 3 27.91	+ 22.8	6 15 41.32	− 1 69	72 22 0.0	+ 6

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
11	29.87	31.5	30.4
12	29.86	37.4	40.8
20	29.85	46.0	49.6
29	29.80	54.0	59.0
33	29.83	51.5	50.8

For summary of the elements of reduction see page 3.

1, 3, 26. Three bisections.
6, 34. Five bisections.
36, 40. One bisection.

ZENITH-POINT CORR.

	″
No. 1 to 11	+ 53.77
No. 12 to 31	+ 53.57
No. 32 to 50	+ 52 31

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
18	− 4.6	+ 5.7	. .	+ 1.1
19	− 4.6	− 5.7	. 0.0	− 10.3
20	− 6.8	− 16 13.9	. .	− 16 20.7
21	− 6.7	+ 16 13.9	. .	+ 16 7.2
34	−11 37.2	− 16 0.8	. .	− 27 38.

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
21	1	O. Arg. S. 5133 .	9	22 47.60	− 1.29	− 30.87	64 33 48.93	+ 4 40.13	+ 2 3.0	6 22 15.44	− 1.43	115 46 53.3	− 5.0
	2	O. Arg. S. 5176 .	5	24 43.48	− 1.29	− 30.87	64 33 48.93	+ 6 14.37	+ 2 3.2	6 24 11.32	− 1.44	115 48 27.7	− 5.1
	3	O. Arg. S. 5198 .	9	25 41.16	− 1.29	− 30.87	64 33 48.93	+ 5 58.15	+ 2 3.2	6 25 9.00	− 1.44	115 48 11.5	− 5.1
	4	O. Arg. S. 5199 .	9	25 42.17	− 1.29	− 30.87	64 33 48.93	+ 6 58.74	+ 2 3.2	6 25 10.01	− 1.41	115 48 32.1	− 5 1
	5	α Canis Majoris .	9	40 17.16	− 1.10	**− 30.90**	55 19 55.10	+ 5 20.70	+ 1 25.0	6 39 45.20	+ 0.09	106 33 2.0	+ 1.5
	6	51 Cephei . . .	6	42 50.85	+21.16	− 30.86	311 35 46.60	+ 4 40.37	− 1 6.0	6 42 41.15	− 0.86	2 45 42.2	+ 1.5
	7	B. A. C. 2819 (R.)	.	. . .	. .	. .	202 9 53.33	+ 3 51.45	+ 24.3	. . . .	. .	28 52 12.1	+ 8.2
	8	B. A. C. 2819 .	.	. . .	. .	. .	337 41 54.55	+ 4 24.21	− 24.3	. . . .	. .	28 52 15.7	+ 8.2
	9	B. A. C. 2900 .	9	31 15.42	− 1.69	− 30.84	78 17 46.20	+ 4 16.69	+ 4 41.3	8 30 42.89	− 1.81	129 33 5.4	− 6.8
	10	Comet I, 1877, S.P.	7	42 21.24	− 5.30	− 30.83	293 49 54.88	+ 3 50.60	− 2 13.4	8 41 25.11	. .	344 57 53.3	. .
	11	B. A. C. 3193 .	9	16 7.67	− 1.61	− 30.83	75 49 54.25	+ 3 39.49	+ 3 52.8	9 15 35.23	− 1.87	127 3 47.7	− 6.6
	12	α Hydræ . . .	9	22 6.46	− 0.96	**− 30.91**	46 55 46.83	+ 4 29.69	+ 1 3.8	9 21 34.68	+ 0.07	98 7 41.5	+ 1.0
	13	d Ursæ Majoris .	5	24 9.49	+ 2.12	− 30.82	328 27 44.57	+ 4 19.57	− 36.4	9 23 40.79	− 0.12	19 37 48.9	− 0.2
	14	Lachesis . .	9	31 25.87	− 0.47	− 30.82	20 31 49.65	+ 6 17.05	+ 22.4	9 30 54.58	. .	71 44 50.3	− 1.5
	15	Uranus I, S. .	6	39 49.43	− 0.54	− 30.82	23 57 48.33	+ 4 53.65	+ 26.6	9 39 18.07	+ 0.19	75 9 29.8	. .
	16	Uranus II, N. .	5	39 49.82	− 0.54	− 30.82	23 57 48.33	+ 4 51.55	+ 26.6	9 39 18.46	− 0.20	75 9 27.7	. .
	17	μ Leonis . . .	9	46 19.57	− 0.29	**− 30.73**	12 13 44.33	+ 4 39.48	+ 13.0	9 45 48.46	− 0.05	63 24 58.0	+ 0.3
	18	Weisse (2) 1047.	9	50 49.18	− 0.49	− 30.82	21 9 50.80	+ 5 3.99	+ 23.2	9 50 17.87	− 2.40	72 21 39.2	− 6.4
	19	Weisse (2) 1106.	9	54 3.70	− 0.48	− 30 82	20 45 44.20	+ 4 44.92	+ 22.7	9 53 32.40	− 2.41	71 57 13.0	− 6.6
	20	Hecate . . .	9	58 53.14	− 0.52	− 30.82	23 7 43.60	+ 6 47.23	+ 25.6	9 58 21.80	. .	74 21 17.6	− 1.3
	21	α Leonis . . .	9	2 22.93	− 0.58	**− 30 83**	26 13 45.35	+ 5 27.47	+ 29.5	10 1 51.54	− 0.02	77 26 3.5	+ 0.7
	22	Weisse (2) 234 .	5	13 29.89	− 0.43	− 30.81	18 19 52.33	+ 4 20.73	+ 19.8	10 12 58.65	− 2.47	69 30 54.1	− 7.9
	23	γ^1 Leonis . . .	5	13 45.06	− 0.43	**− 30.80**	18 20 . .	. . .	. .	10 13 13.82	+ 0.01	. . . .	. .
	24	γ^2 Leonis . . .	3	13 45.34	− 0.43	− 30.81	18 20 . .	. . .	. .	10 13 14.10	− 2.47	. . . .	. .
	25	Weisse 331 . .	9	21 14.50	− 0.60	− 30.81	26 51 46.50	+ 4 59.24	+ 30.3	10 20 43.09	− 2.29	78 3 37.2	− 8.6
	26	Tolosa : . .	9	25 26.44	− 0.53	− 30.81	23 33 45.95	+ 6 10.72	+ 26 2	10 24 55.10	. .	74 46 44.1	− 1.9
25	27	ε Canis Majoris .	9	54 20.77	− 1.46	**− 30.29**	67 35 50.37	+ 3 53.02	+ 2 23.5	6 53 49.09	+ 0.02	118 48 28.1	+ 0.7
	28	δ Canis Majoris .	9	3 56.64	− 1.40	**− 30.29**	64 59 59.32	+ 3 36.81	+ 2 7.2	7 3 25.03	+ 0.03	116 12 4.5	+ 3.3
	29	B. A. C. 2386 .	3	9 43.85	− 1.49	− 30.21	68 53 57.10	+ 5 2.94	+ 2 33.6	7 9 12.15	− 1.53	120 7 54.8	− 6.7
	30	δ Geminorum. .	9	13 19.53	− 0.47	**− 30.06**	16 35 45.65	+ 5 5.11	+ 17.8	7 12 48.45	− 0.19	67 47 29.8	+ 1.0
	31	B. A. C. 2502 .	9	29 57.34	− 1.65	− 30.19	74 53 56.30	+ 34.71	+ 3 37.4	7 29 25.50	− 1.59	126 4 29.6	− 7.6
	32	Anonymous. .	9	33 29.16	− 1.65	− 30.19	74 53 56.30	+ 4 41.19	+ 3 38.4	7 32 57.32	− 1.60	126 8 37.1	− 7.6
	33	B. A. C. 2561 .	9	39 15.28	− 1.64	− 30.18	74 31 54.13	+ 3 52.42	+ 3 33.0	7 38 43.46	− 1.62	125 45 40.8	− 7.6
	34	B. A. C. 2572 .	9	40 13.40	− 1.64	− 30.18	74 31 54.13	+ 4 35.98	+ 3 33.2	7 39 41.58	− 1.62	125 46 24.5	− 7.6
	35	λ Ursæ Min., S. P.	5	47 15.24	−54.81	− 30.18	307 45 53.35	+ 4 55.71	− 1 16.6	19 45 50.25	− 0.60	358 55 53.7	+ 2.1
	36	B. A. C. 2697 (R.)	.	. . .	. .	. .	192 53 52.45	+ 3 57.84	+ 13.7	. . . .	. .	38 8 17.2	+ 9.2
	37	B. A. C. 2697 .	.	. . .	. .	. .	346 57 51.15	+ 4 21.04	− 13.7	. . . .	. .	38 8 19.7	+ 9.2
	38	B. A. C. 2778 (R.)	.	. . .	. .	. .	150 35 55.60	+ 4 44.80	− 33.5	. . . .	. .	80 26 14 3	− 1.1
	39	B. A. C. 2778 .	.	. . .	. .	. .	29 13 57.53	+ 5 23.74	+ 33.5	. . . .	. .	80 26 16.0	− 1.1
	40	ε Hydræ . . .	9	40 48.69	− 0.78	**− 30.11**	31 55 54.27	+ 5 4.67	+ 37.4	8 40 17.78	− 0.07	83 7 57.5	+ 3.1
	41	B. A C. 2980 .	9	42 29.71	− 1.61	− 30.13	72 55 55.98	+ 5 1.57	+ 3 13.6	8 41 57.97	− 1.80	124 10 32.4	− 7.6
	42	Lacaille 3525 .	7	43 4.14	− 1.61	− 30.13	72 55 55.98	+ 3 35.99	+ 3 13.3	8 42 32.40	− 1.80	124 9 6.5	− 7.6
	43	12-y. C. 1879, S. P.	9	53 33.67	− 6.61	− 30.12	298 55 52.37	+ 4 48.01	− 1 47.6	20 52 56.94	+ 0.06	350 5 14.0	+ 2.3
	44	κ Cancri . . .	9	1 38.03	− 0.70	**− 30.06**	27 39 57.95	+ 3 30.59	+ 31.5	9 1 7.22	− 0.02	78 50 21.2	+ 1.7
	45	Moon I, N. . .	9	11 3.34	− 0.56	30.10	20 15 55.68	+ 4 1.89	+ 22.2	9 10 32.68	+73.29	71 26 41.0	. .
	46	α Hydræ . . .	9	22 5.81	− 1.05	**− 30.17**	46 55 51.75	+ 4 25.42	+ 1 4.3	9 21 34.66	+ 0.05	98 7 42.7	+ 1.6
	47	B. A. C. 3254^1 .	3	26 3.30	− 1.55	− 30.09	70 5 55 65	+ 6 7.99	+ 2 45.2	9 25 31.66	− 1.88	121 21 10.0	− 7.7
	48	B. A. C. 3254^2 .	8	26 3.68	− 1.55	− 30.09	70 5 55.65	+ 5 59.22	+ 2 45.2	9 25 32.04	− 1.88	121 21 1.3	− 7.7
	49	B. A. C. 3262 .	7	26 50.26	− 1.53	− 30.09	70 5 55.65	+ 4 57.10	+ 2 45.1	9 26 18.64	− 1.88	121 19 59.1	− 7.7
	50	Weisse 774 . .	8	37 10 98	- 0.93	− 30.08	40 29 59.02	+ 3 45.53	+ 51.4	9 36 39.97	- 2.10	91 40 57.2	− 7.0

Barom.	At. Ther.	Ex. Ther.	*For summary of the elements of reduction see page 3.*	No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
in.	°	°			′ ″	′ ″	′ ″	′ ″
29.83	40.0	36.5		15	− 0.2	− 1.0	. .	− 1.2
29.96	41.5	40.0		16	− 0.2	+ 1.1	. .	+ 0.9
29.98	38.5	35.5		45	−20 59.2	+ 16 39.1	. .	− 4 20.1

ZENITH-POINT CORR.

No. 1 to 26 + ″52.31
No. 27 to 50 + 53.52

5, 37. One bisection.
43. Three bisections.
10. Four bisections.
45. Five bisections.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Feb. 25	1	Anonymous	7	37 18.79	− 0.94	− 30.08	40 29 59.02	+ 5 39.72	+ 51.4	9 36 47.77	− 2.10	91 42 51.3	− 7.0
E.	2	Uranus, C,	.	. . .	. .	. .	23 55 58.05	+ 3 25.79	+ 26.7	. . . .	. .	75 6 11.7	. .
27	3	Uranus, C.	9	38 49.33	− 0.75	− 29.35	23 53 58.30	+ 3 50.50	+ 27.1	9 38 19.23	. .	75 4 37.1	. .
S.	4	α Leonis	9	2 21.61	− 0.80	− **29.26**	26 13 54.20	+ 5 19.23	+ 30.2	10 1 51.46	− 0.13	77 26 4.8	+ 1.9
	5	Weisse (2) 234	8	13 28.69	− 0.62	− 29.35	18 20 0.75	+ 4 11.93	+ 20.3	10 12 58.72	− 2.50	69 30 54.2	− 7.7
	6	γ¹ Leonis	8	13 43.72	− 0.62	− **29.23**	18 20 0.75	+ 5 40.31	+ 20.3	10 13 13 75	− 0.10	69 32 22.6	+ 2.9
	7	9 Draconis	9	25 10.50	+ 3.79	− 29.35	322 29 57.20	+ 3 47.21	− 46.7	10 24 44.84	+ 0.04	13 39 18.9	− 0.7
	8	226 Cephei, S. P.	5	30 34.48	− 5.58	− 29.35	294 27 57.25	+ 3 30.28	− 2 13.0	22 30 0.55	+ 0.96	345 35 35.7	+ 3.0
	9	*l* Leonis (R.)	.	. . .	. .	. .	152 13 58.42	+ 4 28.34	− 32.0	. . . .	. .	78 48 26.4	+ 1.4
	10	*l* Leonis	.	. . .	. .	. .	27 37 57 58	+ 3 36.21	+ 32.0	. . . .	. .	78 48 27.0	+ 2.0
	11	Moon II, S.	9	8 47.34	− 0.99	− 29.35	34 30 1.17	+ 5 25.33	+ 42.1	11 8 17.00	−68.97	85 42 29.8	. .
	12	δ Crateris	5	13 44.35	− 1.40	− **29.39**	52 56 0.98	+ 3 16.11	+ 1 20.9	11 13 13.60	+ 0.04	104 6 59.2	+ 2.2
	13	τ Leonis	9	22 9.30	− 1.01	− **29.42**	35 16 0.78	+ 5 7.02	+ 43.3	11 21 38.84	− 0.06	86 28 12.3	+ 1.2
	14	λ Draconis	5	24 38.89	+ 2.16	− 29.35	328 49 59.60	+ 3 53.30	− 36.8	11 24 11.70	+ 0.56	19 59 37.3	− 0.3
	15	υ Leonis	5	31 11.78	− 1.09	− **29.49**	38 57 57.73	+ 3 45.96	+ 49.5	11 30 41.34	+ 0.11	90 8 54.4	+ 1.6
	16	B. A. C. 3981	9	40 5.59	+ 0.27	− 29.35	350 22 0.10	+ 4 20.87	− 10.3	11 39 36.51	− 3.44	41 32 31.9	−14.1
	17	β Leonis	9	43 19.60	− 0.75	− **29.44**	23 33 56.32	+ 3 56.89	+ 26.7	11 42 49.50	+ 0.08	74 44 41.1	+ 2.8
P.	18	ζ Cygni	9	8 11.16	− 0.22	− **29.69**	9 5 56.12	+ 4 20.75	+ 9.6	21 7 41.24	+ 0.02	60 16 47.7	− 0.2
	19	α Cephei (R.)	.	. . .	. .	. .	203 5 52.15	+ 3 47.63	+ 25.4	. . . .	. .	27 56 16.0	− 3.0
	20	α Cephei	.	. . .	. .	. .	336 45 57.58	+ 4 25.02	− 25.4	. . . .	. .	27 56 18.4	− 0.6
	21	ε Pegasi	9	38 38.61	− 0.67	− **29.68**	29 29 56.22	+ 4 36.19	+ 33.6	21 38 8.23	− 0.03	80 41 27.2	+ 2.1
	22	Venus I, S.	5	43 43.16	− 1.15	− 29.71	53 37 55.98	+ 4 23.04	+ 1 20.5	21 43 12.30	+ 0.32	104 50 0.7	. .
	23	Venus II, N.	6	43 43.83	− 1.15	− 29.71	53 7 55.98	+ 4 12.35	+ 1 20.5	21 43 12.97	− 0.35	104 49 50.0	. .
	24	α Aquarii	3	59 58.24	− 0.86	− **29.75**	39 44 . .	. .	. .	21 59 27.67	+ 0.06	. . . .	. .
28	25	Sun I, N.	9	46 35.76	− 0.99	− 29.72	46 15 58.55	+ 3 53.43	+ 1 1.7	22 46 5.05	+65.41	97 27 14.9	. .
	26	Sun II, S.	9	48 46.57	− 0.99	− 29.72	46 47 57.58	+ 4 9.47	+ 1 2.9	22 48 15.86	−65.40	97 59 31.1	. .
	27	ε Piscium	9	57 3.80	− 0.66	− **29.71**	31 34 . .	. .	. .	0 56 33.41	− 0.03	. . . .	. .
	28	β Andromedæ	9	3 20.02	− 0.01	− 29.73	3 51 53.00	+ 3 31.31	+ 4.0	1 2 50.28	+ 0.67	55 1 49.5	+ 8.3
	29	Polaris	5	12 26.84	+48.20	− 29.73	310 9 54.30	+ 5 23.77	− 1 9.2	1 12 45.31	+ 3.15	1 20 30.1	+ 2.4
	30	η Piscium	9	25 24.30	− 0.51	− **29.77**	24 5 53.18	+ 4 37.19	+ 26.3	1 24 54.06	+ 0.12	75 17 17.9	+ 3.7
	31	ο Piscium	9	39 24.33	− 0.64	− **29.74**	30 16 . .	. .	. .	1 38 53.95	− 0.05	. . . .	. .
	32	β Arietis	9	48 20.83	− 0.38	− **29.72**	18 36 . .	. .	. .	1 47 50.71	0.00	. . . .	. .
	33	κ Cancri	9	1 37.52	− 0.68	− **29.57**	27 39 56.32	+ 3 32.12	+ 31.8	9 1 7.36	+ 0.13	78 50 21.4	+ 1.9
	34	α Cephei, S. P.	9	16 8.26	− 2.85	− 29.48	280 57 51.82	+ 4 29.95	− 5 1.6	21 15 35.93	+ 0.32	332 3 41.4	+ 0.6
	35	α Hydræ	9	22 5.13	− 1.07	− **29.47**	46 55 53.22	+ 4 24.83	+ 1 4.9	9 21 34.58	− 0.03	98 7 44.1	+ 2.6
	36	Lachesis.	8	25 56.21	− 0.55	− 29.48	20 23 56.28	+ 4 54.99	+ 22.6	9 25 26.18	. .	71 35 35.1	− 1.4
	37	Weisse 774	8	37 10.45	− 0.94	− 29.48	40 29 54.35	+ 3 50.06	+ 51.8	9 36 40.03	− 2.10	91 40 57.4	− 7.3
	38	Anonymous	5	37 18.11	− 0.94	− 29.48	40 29 54.35	+ 5 46.57	+ 51.8	9 36 47.69	− 2.10	91 42 53.9	− 7.3
	39	μ Leonis	9	46 18.40	− 0.37	− **29.46**	12 13 53.35	+ 4 30.89	+ 13.2	9 45 48.55	+ 0.02	63 24 58.6	+ 1.4
	40	Hecate	9	53 43.43	− 0.59	− 29.48	22 33 53.55	+ 6 30.42	+ 25.3	9 53 13.36	. .	73 47 10.5	− 1.3
	41	α Leonis	9	2 21.63	− 0.67	− **29.41**	26 13 49.58	+ 5 22.91	+ 30.0	10 1 51.48	− 0.11	77 26 3.7	+ 0.8
	42	226 Cephei, S. P.	5	30 34.14	− 4.97	− 29.48	294 27 53.30	+ 3 31.77	− 2 12.3	22 29 59.69	+ 0.11	345 35 34.0	+ 1.5
	43	B. A. C. 3742¹ (R.)	.	. . .	. .	. .	166 25 52.25	+ 4 52.22	− 14.6	. . . .	. .	64 35 51.3	−10.2
	44	B. A. C. 3742¹	.	. . .	. .	. .	13 23 53.20	+ 5 22.48	+ 14.6	. . . .	. .	64 35 51.5	−10.2
	45	α Ursæ Maj. (R.)	.	. . .	. .	. .	203 25 50.32	+ 4 49.95	+ 20.4	. . . .	. .	27 35 14.5	− 1.7
	46	α Ursæ Majoris	.	. . .	. .	. .	336 23 54.88	+ 5 27.04	− 26.4	. . . .	. .	27 35 16.7	+ 0.5
	47	B. A. C. 3822	9	4 32.00	− 1.60	− 29.47	70 27 56.85	+ 4 59.31	+ 2 50.6	11 4 0.93	− 1.95	121 42 8.0	− 8.8
	48	B. A. C. 3890	9	19 4.97	− 1.71	− 29.47	74 9 56.58	+ 3 35.43	+ 3 32.4	11 18 33.79	− 1.95	125 23 25.6	− 8.4
	49	Polaris, S. P.	5	13 59.80	−45.35	− 29.47	307 30 . .	. .	. .	1 12 44.98	+ 3.12	. . . .	. .
	50	α Virginis.	9	19 15.28	− 1.12	− **29.48**	49 20 . .	. .	. .	13 18 44.69	− 0.02	. . . .	. .

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
3	30.19	35.3	31.6
12	30.19	34.0	30.2
17	34.19	34.0	30.4
18	30.15	40.5	42.2
22	30.16	42.9	44.6
26	30.15	45.5	46.8
29	30.10	47.6	48.2
33	30.16	37.2	34.7
40	30.18	36.4	34.1
48	30.19	35.2	32.4

For summary of the elements of reduction see page 3.

11. Three bisections.
28, 39, 41. Four bisections.
29. Five bisections.
38. One bisection.

ZENITH-POINT CORR.

No. 1 to 2 + 53.52″
No. 3 to 17 + 53.18
No. 18 to 30 + 53.24
No. 33 to 48 + 53.59

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 0.2	. .	. .	− 0.2
3	− 0.2	. .	. .	− 0.2
11	− 34 12.5	− 16 32.6	. .	− 50 45.1
22	− 4.4	− 5.4	+ 0.1	− 9.7
23	− 4.4	+ 5.4	. .	+ 1.0
25	− 6.4	+ 16 8.1	. .	+ 16 1.7
26	− 6.5	− 16 8.1	. .	− 16 14.6

ATE ND S'R.	Number.	Object.	Threads.	Mean Thread	Corrections. Inst.	Corrections. Clock.	Zenith Dist. South, from Circles.	Corrections. Instrument.	Corrections. Refraction.	Apparent Right Ascension.	Miscellaneous Correction.	Apparent North-Polar Distance.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
.28P.	1	ζ Virginis . . .	9	28 57.80	– 0.92	**– 29.46**	38 46 . .	. . .	. .	13 28 27.41	– 0.02	. . . .	. .
E.	2	γ Aquilæ . . .	9	40 54.84	– 0.59	**– 29.64**	28 29 58.82	+ 4 27.85	+ 32.9	19 40 24.62	+ 0.04	79 41 20.8	– 0.8
	3	α Aquilæ . . .	9	45 17.09	– 0.62	**– 29.66**	30 15 55.25	+ 4 41.51	+ 35.4	19 44 46.84	+ 0.07	81 27 33.4	+ 0.3
	4	γ Cygni . . .	9	18 17.31	+ 0.11	– 29.63	358 57 55.22	+ 4 10.85	– 1.0	20 17 47.79	+ 1.00	50 8 26.3	–17.1
	5	B. A. C. 7149 .	8	34 25.20	– 0.47	– 29.63	23 19 55.90	+ 4 44.92	+ 26.0	20 33 55.1[illegible]	+ 0.41	74 31 28.0	–13.5
	6	α Cygni . . .	9	37 42.36	+ 0.28	**– 29.59**	353 58 0.32	+ 5 31.78	– 6.3	20 37 13.01	0.00	45 9 47.0	+ 1.1
	7	Mercury II, C. .	9	15 36.54	– 1 10	– 29.62	56 1 58.85	+ 3 46.89	+ 1 28.5	21 15 5.82	– 0.21	107 13 35.4	. .
	8	β Cephei . . .	.	. . .	. .	. .	328 47 53.38	+ 5 15.96	– 35.9	. . . .	. .	19 58 54.6	– 0.1
	9	ε Pegasi . . .	9	38 38.48	– 0.59	**– 29.62**	29 29 58.28	+ 4 33.22	+ 33.7	21 38 8.27	. .	80 41 26.4	+ 1.2
	10	Venus II, N. .	9	48 37.27	– 1.04	– 29.61	53 13 53.55	+ 5 4.45	+ 1 19.4	21 48 6.62	– 0.36	104 26 38.6	. .
	11	Venus S. . .	.	. . .	. .	. .	53 13 53.55	+ 5 16.29	+ 1 19.5	. . . .	. .	104 26 50.5	. .
r. 1	12	Sun I, N. . .	9	50 20.08	– 0.90	– 29.60	45 51 56.82	+ 5 2.45	+ 1 0.7	22 49 49.58	. .	97 4 21.2	. .
	13	Sun II, S. . .	9	50 30.92	– 0.90	– 29.60	46 23 57.02	+ 5 26.18	+ 1 2.0	22 52 0.42	. .	97 36 46.4	. .
	14	β Andromedæ .	9	3 19.83	– 0.06	– 29.58	3 51 54.90	+ 3 28.44	+ 4.0	1 2 50.19	+ 0.68	55 1 48.5	+ 8.2
	15	Polaris . . .	5	12 26.20	+44.51	– 29.58	310 9 54.98	+ 5 21.41	– 1 8.9	1 12 41.13	– 0.43	1 20 28.7	+ 0.7
2	16	γ Aquilæ . . .	9	40 54.43	– 0.68	**– 29.09**	28 29 59.35	+ 4 30.51	+ 32.0	19 40 24.67	+ 0.04	79 41 23.1	+ 1.4
S.	17	α Aquilæ . . .	9	45 16.64	– 0.71	**– 29.07**	30 15 54.72	+ 4 43.76	+ 34.4	19 44 46.85	+ 0.03	81 27 34.1	+ 0.9
3	18	Polaris . . .	5	12 26.22	+42.90	– 28.99	310 9 53.62	+ 5 22.77	– 1 8.0	1 12 40.13	– 0.41	1 20 29.6	+ 1.1
	19	β Arietis . . .	4	48 20.10	– 0.44	**– 28.96**	18 36 . .	. . .	. .	1 47 50.68	0.00	. . . .	. .
	20	α Arietis . . .	9	0 43.79	– 0.39	**– 28.99**	15 55 51.58	+ 4 37.99	+ 16.5	2 0 14.43	+ 0.03	67 7 7.3	+ 3.7
5	21	ζ Cygni . . .	9	8 9.64	– 0.22	**– 28.06**	9 5 55.98	+ 4 22.22	+ 9.8	21 7 41.23	– 0.10	60 16 49.2	+ 0.3
	22	β Aquarii . . .	9	25 34.09	– 0.98	**– 28.26**	44 54 . .	. . .	. .	21 25 4.93	+ 0.09	. . . .	. .
	23	ε Pegasi . . .	9	38 37.24	– 0.67	**– 28.22**	29 30 0.72	+ 4 30.45	+ 34.5	21 38 8.39	+ 0.04	80 41 26.9	+ 1.4
	24	Mercury, C.. .	9	43 15.21	– 1.16	– 28.18	54 21 56.65	+ 4 20.54	+ 1 24.9	21 42 45.87	– 0.04	105 34 3.3	. .
	25	α Aquarii . . .	8	59 56.77	– 0.87	**– 28.19**	39 43 57.50	+ 3 57.42	+ 50.6	21 59 27.73	+ 0.04	90 55 6.7	+ 0.2
	26	Venus II, S.. .	9	12 47.67	– 1.10	– 28.16	51 13 56.72	+ 3 38.02	+ 1 15.6	22 12 18.41	– 0.36	102 25 11.5	. .
	27	Venus, N. . .	.	. . .	. .	. .	51 13 56.72	+ 3 24.93	+ 1 15.6	. . . .	. .	102 24 58.4	. .
6	28	Sun I, N. . .	9	8 54.66	– 0.94	– 28.14	43 58 0.50	+ 3 10.82	+ 58.3	23 8 25.58	. .	95 9 0.8	. .
	29	Sun II, S. . .	9	11 4.71	– 0.94	– 28.14	44 29 57.30	+ 3 59.57	+ 59.4	23 10 35.63	. .	95 41 17.5	. .
	30	α Andromedæ .	9	2 29.50	– 0.22	**– 28.10**	10 23 55.35	+ 4 51.76	+ 11.1	0 2 1.17	+ 0.02	61 35 19.4	+ 2.5
	31	γ Pegasi . . .	9	7 22.33	– 0.54	**– 28.03**	24 17 56.52	+ 5 16.67	+ 27.2	0 6 53.68	– 0.07	75 30 1.6	+ 1.4
	32	β Ceti	9	37 54.21	– 1.21	**– 28.20**	57 27 55.75	+ 3 55.75	+ 1 33.9	0 37 24.90	+ 0.16	108 39 46.6	+ 1.2
	33	Polaris . . .	4	12 19.65	+47.25	– 28.08	310 9 56.30	+ 5 24.08	– 1 10.4	1 12 39.02	– 0.29	1 20 31.2	+ 1.8
7	34	α Leonis . . .	9	2 19.72	– 0.72	**– 27.44**	26 13 52.38	+ 5 22.10	+ 29.4	10 1 51.58	– 0.02	77 26 5.1	+ 2.2
	35	Tolosa . . .	6	12 14.20	– 0.64	– 27.42	22 27 52.32	+ 5 44.93	+ 24.7	10 11 46.14	. .	73 40 23.1	. .
	36	ι Cephei, S. P. . .	8	45 46.00	– 3.65	– 27.40	284 25 54.95	+ 4 41.81	+ 3 45.9	22 45 14.95	+ 0.34	335 33 12.1	+ 1.1
	37	α Ursæ Maj. (R.) .	.	. . .	. .	. .	203 25 52.85	+ 4 50.22	+ 25.8	. . . .	. .	27 35 12.3	– 2.2
	38	α Ursæ Majoris .	6	56 38.53	+ 1.32	– 27.40	336 23 57.65	+ 5 21.46	– 25.8	10 56 12.45	+ 0.11	27 35 14.5	0.0
	39	δ Leonis . . .	9	8 4.39	– 0.52	**– 27.39**	17 37 53.28	+ 3 48.03	+ 19.0	11 7 36.48	– 0.05	68 48 21.5	+ 1.3
	40	δ Crateris . . .	8	13 42.32	– 1.30	**– 27.40**	52 55 55.95	+ 3 24.62	+ 1 18.7	11 13 13.63	+ 0.01	104 7 0.5	+ 2.2
	41	τ Leonis . . .	8	22 7.25	– 0.92	**– 27.38**	35 15 55.08	+ 5 15.40	+ 42.2	11 21 38.94	– 0.04	86 28 13.9	+ 2.3
	42	λ Draconis . .	7	24 36.55	+ 2.33	– 27 39	228 49 58.12	+ 3 51.62	– 35.8	11 24 11.49	+ 0.22	19 59 35.1	– 0.3
	43	B. A. C. 4002 (R.)	.	. . .	. .	. .	143 29 57.45	+ 4 22.18	– 43.8	. . . .	. .	87 32 45.4	–13.6
	44	B. A. C. 4002 .	.	. . .	. .	. .	36 19 58.35	+ 5 43.17	+ 43.8	. . . .	. .	87 32 46.5	–13.6
	45	12¹ Canum Venat. .	6	50 45.27	– 0.02	– 27.35	359 49 58.18	+ 5 16.34	– 0.1	12 50 17.90	– 2.81	51 1 35.6	–19.4
	46	12² Canum Venat. .	5	50 46.53	– 0.02	**– 27.35**	359 49 58.18	+ 5 2.59	– 0.1	12 50 19.16	+ 0.03	51 1 21.9	+ 1.9
	47	Polaris, S. P.. .	5	13 58.18	–52.48	– 27.34	307 29 55.80	+ 4 30.71	– 1 17.0	1 12 38.36	– 0.34	358 39 30.7	+ 0.4
9	48	λ Ursæ Min., S. P.	5	47 11.06	+43.94	– 27.27	307 45 44.58	+ 5 4.29	– 1 17.9	19 45 59.85	+ 0.68	358 55 52.2	+ 3.3
E.	49	B. A. C. 2758 .	9	6 59.14	– 1.49	– 27.24	75 41 52.18	+ 3 42.57	+ 3 55.2	8 6 30.41	– 1.58	126 55 51.2	–10.2
	50	B. A. C. 2780 .	8	10 10.99	– 1.56	– 27.24	78 43 52.62	+ 3 23.12	+ 4 58.0	8 9 42.19	– 1.52	129 58 34.9	–10 5

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.24	36.5	36.5
30.22	46.6	49.8
30.28	56.5	53.5
29.94	46.0	45.8
29.95	58.6	54.3
29.92	54.6	54.6
30.22	32.8	32.0
30.21	36.6	36.6
30.19	38.6	38.6
30.08	43.4	41.2
30.06	43.6	41.4
30.01	43.2	41.2
29.87	32.5	29.0

For summary of the elements of reduction see page 3.

16. One bisection.
15, 18, 33, 35, 47. Three bisections.

ZENITH-POINT CORR.

No. 2 to 15 + 52.75
No. 16 to 20 + 52.51
No. 21 to 33 + 53.54
No. 34 to 47 + 52.08
No. 48 to 50 + 55.85

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	– 6.7	. .	+ 0.3	– 6.4
10	– 4.4	+ 6.0	. .	+ 1.6
11	– 4.4	– 6.0	+ 0.1	– 10.3
12	– 6.4	+ 16 12.6	. .	+ 16 6.2
13	– 6.4	– 16 12.6	. .	– 16 19.0
24	– 6.2	. .	+ 0.3	– 5.9
26	– 4.2	– 6.6	+ 0.1	– 10.7
27	– 4.2	+ 6.6	. .	+ 2.4
28	– 6.2	+ 16 8.4	. .	+ 16 2.2
29	– 6.2	– 16 8.3	. .	– 16 14.5

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Mar. 9 E.	1	B. A. C. 2795 .	9	14 27.32	− 1.47	− 27.23	75 1 54.62	+ 4 54.74	+ 3 45.0	8 13 58.62	− 1.55	126 16 55.6	−1
	2	Lacaille 3325 .	9	22 49.97	− 1.36	− 27.21	70 1 53.08	+ 5 14.65	+ 2 46.6	8 22 21.40	− 1.61	121 16 15.5	−
	3	Lacaille 3373 .	8	27 3.70	− 1.53	− 27.20	77 23 50.88	+ 4 21.57	+ 4 27.6	8 26 34.97	− 1.59	128 39 1.2	−1
	4	B. A. C. 2577 .	8	27 22.33	− 1.53	− 27.20	77 23 50.88	+ 4 30.24	+ 4 27.7	8 26 53.60	− 1.60	128 39 10.0	−1
	5	Brisbane 2071 .	5	27 54.51	− 1.53	− 27.20	77 23 50.88	+ 4 32.18	+ 4 27.7	8 27 25.78	− 1.60	128 39 12.0	−1
	6	ε Hydræ . . .	9	40 45.58	− 0.73	− **27.12**	31 55 51.95	+ 5 5.54	+ 38.0	8 40 17.68	− 0.10	83 7 56.7	+
	7	B. A. C. 3012 .	9	45 44.16	− 1.53	− 27.16	77 25 52.78	+ 4 35.24	+ 4 28.9	8 45 15.47	− 1.66	128 41 18.1	−1
	8	B. A. C. 3030 .	9	48 36 54	− 1.52	− 27.15	76 59 53.92	+ 5 15.32	+ 4 20.3	8 48 7.87	− 1.68	128 15 50.7	−1
	9	B. A. C. 3094 .	9	57 53.97	− 1.54	− 27.14	77 39 54.60	+ 4 32.75	+ 4 34.3	8 57 25.29	− 1.70	128 55 22.9	−1
	10	κ Cancri . . .	9	1 35.03	− 0.67	− **27 14**	27 39 55.18	+ 3 33.97	+ 32.0	9 1 7.23	+ 0.04	78 50 22.4	+
	11	B. A. C. 3163 .	8	11 16.25	− 1.53	− 27.11	76 47 51.98	+ 5 11.43	+ 4 16.6	9 10 47.61	− 1.75	128 3 41.2	−1
	12	α Hydræ . . .	9	22 2.64	− 0.96	− **27.12**	46 55 52.08	+ 4 25.88	+ 1 5.4	9 21 34.59	+ 0.01	98 7 44.6	+
	13	B. A. C. 3254¹ .	6	26 0.07	− 1.38	− 27.08	70 5 51.32	+ 6 10.91	+ 2 48.2	9 25 31.61	− 1.82	121 21 11.6	−1
	14	B. A. C. 3254² .	5	26 0.46	− 1.38	− 27.08	70 5 51.32	+ 6 4.10	+ 2 48.2	9 25 32.00	− 1.82	121 21 4.8	−1
	15	B. A. C. 3262 .	5	26 46.88	− 1.38	− 27.08	70 5 51.32	+ 5 0.20	+ 2 48.0	9 26 18.42	− 1.82	121 20 0.7	−1
	16	Piazzi IX, 142 .	9	32 22.56	− 1.38	− 27.06	70 23 50.72	+ 4 42.50	+ 2 50.8	9 31 54.12	− 1.83	121 37 45.2	−1
	17	Uranus I, C. .	6	37 14.60	− 0.61	− 27.05	23 45 51.85	+ 4 28.61	+ 27.0	9 36 46.94	. .	74 57 8.7	.
	18	Uranus II . .	5	37 15.00	− 0.61	− 27.05	23 46 . .	. .	. .	9 36 47.34	. .	. . . .	.
	19	ε Leonis . . .	9	39 22.01	− 0.46	− **26.97**	14 27 47.08	+ 5 17.57	+ 15.9	9 38 54.50	− 0.11	65 39 41.7	+ 1
	20	Hecate . . .	7	47 39.75	− 0.59	− 27.03	21 55 53.60	+ 6 10.83	+ 24.8	9 47 12.13	. .	73 8 50.4	− 1
	21	ο Leonis . . .	9	2 19.29	− 0.65	− **27.07**	26 13 48.32	+ 5 23.82	+ 30.3	10 1 51.64	+ 0.04	77 26 3.6	+
	22	Tolosa . . .	8	10 29.91	− 0.59	− 26.98	22 19 52.95	+ 6 2.71	+ 25.3	10 10 2.34	. .	73 32 42.2	− 1
	23	γ¹ Leonis . . .	6	13 41.42	− 0.53	− **27.00**	18 19 51.02	+ 5 48.12	+ 21.9	10 13 13.91	+ 0.04	69 32 22.2	+
	24	γ² Leonis . . .	5	13 41.86	− 0.53	− 26.98	18 19 51.02	+ 5 49.91	+ 21.9	10 13 14.35	− 2.52	69 32 24.0	−
14	25	ε Pegasi . . .	9	38 34.27	− 0.50	− **25.27**	29 29 52.95	+ 4 39.23	+ 34.2	21 38 8.50	0.00	80 41 27.6	+ 1
P.	26	α Aquarii . . .	9	59 53.78	− 0.64	− **25.29**	39 43 54.48	+ 4 2.25	+ 50.1	21 59 27.87	+ 0.04	90 55 8.0	+ 1
	27	Mercury II, C. .	9	36 36.79	− 0.79	− 25.26	50 1 53.68	+ 4 11.55	+ 1 11.6	22 36 10.74	− 0.18	101 13 38.0	.
	28	Venus I, C. . .	6	35 16.55	− 0.75	− 25.26	47 13 53.12	+ 4 35.73	+ 1 4.8	22 54 50.54	+ 0.42	98 25 54.8	.
	29	Venus II . .	5	55 17.40	− 0.75	− 25.26	47 14 . .	. .	. .	22 54 51.39	− 0.43	. . . .	.
	30	α Pegasi . . .	9	59 3.29	− 0.41	− **25.24**	24 16 . .	. .	. .	22 58 37.62	0.00	. . . .	.
15	31	Sun I, S. . .	9	41 55.94	− 0.64	− 25.25	40 57 54.85	+ 4 13.96	+ 51.9	23 41 30.05	. .	92 9 21.9	.
	32	Sun II, N. . .	9	44 5.01	− 0.64	− 25.25	40 25 55.78	+ 4 3.66	+ 50.9	23 43 39.12	. .	91 37 11.5	.
	33	Polaris . . .	5	12 26.32	+34.32	− 25.23	310 9 53 92	+ 5 27.95	− 1 9.8	1 12 35.41	+ 0.22	1 20 33.3	+ 1
	34	η Piscium . . .	9	25 19.54	− 0.39	− **25.21**	24 5 54.80	+ 4 35.78	+ 26.6	1 24 53.93	+ 0 07	75 17 18.4	+
	35	β Arietis . . .	9	48 16.11	− 0.30	− **25.21**	18 35 53.82	+ 5 0.15	+ 20.0	1 47 50.59	+ 0.01	69 47 35.2	+
	36	α Arietis . . .	9	0 39.80	− 0.26	− **25.24**	15 55 53.35	+ 4 35.80	+ 17.0	2 0 14.32	+ 0.03	67 7 7.4	+ 2
	37	λ Ursæ Min., S. P.	4	47 12.75	−41.51	− 25.16	307 45 54.08	+ 4 52.41	− 1 17.1	19 46 6.08	− 0.08	358 55 50.6	+ 2
	38	3 Ursæ Majoris .	9	1 1.29	+ 1.33	− 25.16	329 59 54.20	+ 4 5.48	− 34.6	8 0 37.46	− 0.39	21 9 46.3	+ 1
	39	B A. C. 2762 .	9	7 25.70	− 1.33	− 25.15	77 59 53.95	+ 4 30.46	+ 4 37.5	8 6 59.22	− 1.40	129 15 23.1	−11
	40	κ Cephei, S. P. .	9	13 23.67	− 4.02	− 25.15	296 11 53.55	+ 3 52.63	− 2 1.3	20 12 54.50	+ 0.29	347 20 6.1	+ 3
	41	B. A. C. 2819 (R.) .		. . . .	. .	. .	202 9 51.88	+ 3 56.63	+ 24.6	. . . .	. .	28 52 8.1	+12
	42	B. A. C. 2819 .	7	20 30.18	+ 0.74	− 25.15	337 41 54.72	+ 4 20.13	− 24.6	8 20 5.77	− 3.94	28 52 11.4	+12
	43	η Cancri . . .	9	26 3.17	− 0.37	− 25.15	17 57 53.25	+ 3 58.82	+ 19.6	8 25 37.65	− 2.15	69 8 32.9	+ 0
	44	Groom. 3241, S. P.	9	30 55.89	− 3.00	− 25.15	290 57 52.58	+ 4 57.94	− 2 35.1	20 30 27.74	+ 0.24	342 6 36.6	+
	45	ε² Hydræ . . .	9	40 43.34	− 0.57	− **25 10**	31 55 55.10	+ 5 2.69	+ 37.6	8 40 17.62	− 0.10	83 7 56.6	+ 1
	46	O. Arg. N. 9450.	9	50 24.13	+ 0.23	− 25.14	350 17 54.15	+ 4 29.70	− 10.2	8 49 59.22	− 3.22	41 28 34.8	+ 6
	47	ι Ursæ Majoris .	9	51 14.88	+ 0.23	− 25.14	350 17 54.15	+ 4 25.54	− 10.2	8 50 49.97	+ 0.05	41 28 30.7	0
	48	12-y. C. 1879, S. P.	5	53 28.42	− 5.02	− 25.14	298 55 51.32	+ 4 44.63	− 1 48.0	20 52 58.26	+ 0.33	350 5 9.2	+
	49	κ Cancri . . .	9	1 32.81	− 0.51	− **25.18**	27 39 56.55	+ 3 32.15	+ 31.6	9 1 7.16	+ 0.02	78 50 21.5	+
	50	B. A. C. 3146 (R.) .		. . . .	. .	. .	143 51 52.72	+ 5 1.73	− 43.8	. . . .	. .	87 10 10.6	− 6

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
24	30.00	29.0	26.0
25	29.92	33.5	32.6
26	29.91	34.4	33.4
27	29.91	34.3	31.3
31	29.91	37.5	37.0
33	29.87	40.8	40.3
36	29.89	42.8	40.4
37	29.93	36.4	34.8
44	29.94	36.0	34.3

For summary of the elements of reduction see page 3.

5. One bisection.
33. Five bisections.
27, 28, 43. Four bisections.
37. Three bisections.

ZENITH-POINT CORR.

No. 1 to 24 + 55.″85
No. 25 to 36 + 54.48
No. 37 to 50 + 55.15

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
17	− 0.2	. .	. .	− 0
27	− 5.4	. .	+ 0.2	− 5
28	− 3.9	. .	+ 0.1	− 3
31	− 5.8	− 16 5.2	. .	− 16 11
32	− 5.7	+ 16 5.2	. .	+ 15 59

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
.15	1	B. A. C. 3146	3	8 25.69	− 0.62	− 25.14	35 57 53.92	+ 5 13.04	+ 43.8	9 7 59.93	− 2.02	87 10 12.0	− 6.1
.	2	α Cephei, s. p.	9	16 3.28	− 2.07	− 25.14	280 57 51.98	+ 4 25.46	− 4 59.9	21 15 36.07	+ 0.04	332 3 38.7	+ 1.7
	3	ι Draconis (r.)	.	. . . .	. .	. .	222 53 51.82	+ 3 47.83	+ 56.0	. . . . .	. .	8 7 45.6	− 0.6
	4	ι Draconis	3	19 57.67	+ 4.78	− 25.14	316 57 54.65	+ 4 29.66	− 56.0	9 19 37.31	− 0.30	8 7 49.5	+ 3.3
	5	B. A. C. 3303 (r.)	.	. . . .	. .	. .	140 27 57.75	+ 3 57.81	− 49.5	. . . . .	. .	90 35 15.1	− 8.0
	6	B. A. C. 3303		. . . .	. .	. .	39 23 54.50	+ 4 11.24	+ 49.5	. . . . .	. .	90 35 16.4	− 8.0
	7	ε Leonis	9	39 19.96	− 0.27	**− 25.13**	14 27 54.42	+ 5 10.41	+ 15.6	9 38 54.56	− 0.03	65 39 41.6	+ 1.5
	8	μ Leonis	9	46 13.84	− 0.26	**− 25.08**	12 13 51.88	+ 4 30.59	+ 13.1	9 45 48.45	− 0.04	63 24 56.8	+ 0.9
	9	79 Draconis, s. p.	9	51 43.31	− 3.17	− 25.13	291 59 53.32	+ 3 17.58	− 2 27.7	21 51 15.01	+ 0.15	343 7 4.4	+ 1.2
	10	Weisse (2) 1236	9	59 28.33	− 0.42	− 25.13	22 27 52.65	+ 4 11.90	+ 25.0	9 59 2.78	− 2.40	73 38 50.8	− 6.6
	11	α Leonis	9	2 17.09	− 0.48	− 25.12	26 13 51.65	+ 5 21.86	+ 29.8	10 1 51.19	− 0.09	77 26 4.5	+ 1.7
	12	B. A. C. 7851, s. p.	5	23 1.88	−10.76	− 25.12	304 19 53.55	+ 4 27.34	− 1 27.9	22 22 26.00	+23.27	355 29 14.2	+ 4.8
	13	Anonymous	5	29 18.86	− 0.45	− 25.12	25 1 52.98	+ 4 43.16	+ 28.3	10 28 53.29	− 2.41	76 13 25.6	− 9.0
	14	Aemilia	6	29 20.72	− 0.45	− 25.12	25 1 52.98	+ 4 46.06	+ 28.3	10 28 55.15	. .	76 13 28.5	− 1.9
	15	ι Cephei, s. p.	9	45 42.29	− 2.32	− 25.11	284 25 54.10	+ 4 42.29	− 3 49.5	22 45 14.86	+ 0.14	335 33 8.1	− 1.7
	16	B. A. C. 3742^1	6	49 25.12	− 0.27	− 25.11	13 23 53.18	+ 5 22.03	+ 14.5	10 48 59.74	− 2.69	64 35 50.9	− 9.0
	17	B. A. C. 3742'	5	49 25.60	− 0.27	− 25.11	13 23 53.18	+ 5 23.65	+ 14.5	10 49 0.22	− 2.69	64 35 52.5	− 9.0
	18	B. A. C. 3763	9	53 53.80	− 1.19	− 25.11	71 51 56.45	+ 3 30.82	+ 3 3.1	10 53 27.50	− 2.00	123 4 51.6	−12.6
	19	B. A. C. 3906	5	23 40.35	+ 4.83	− 25.10	317 1 54.65	+ 4 32.14	− 56.1	11 23 20.08	−14.40	8 11 51.9	− 4.7
	20	Hermione	9	29 47.08	− 0.43	− 25.10	24 25 55.92	+ 4 50.33	+ 27.5	11 29 21.55	. .	75 37 34.9	− 1.3
	21	Taylor 6304	9	41 7.89	− 1.34	− 25.10	78 33 55.08	+ 4 54.11	+ 4 52.9	11 40 41.45	− 2.09	129 50 3.3	−12.0
	22	Groom. 1163, s. p.	9	49 14.59	− 3.28	− 25.10	292 35 55.68	+ 3 45.35	− 2 23.7	23 48 46.21	− 0.21	313 43 38.5	+ 1.9
	23	B. A. C. 4079	9	1 21.78	− 0.49	− 25.09	28 27 57.85	+ 4 32.03	+ 32.9	12 0 56.20	− 2.38	79 39 24.0	−14.8
	24	Thyra	9	6 25.80	− 0.89	− 25.09	55 35 55.92	+ 5 34.10	+ 1 28.4	12 5 59.82	. .	106 49 19.6	− 4.2
	25	Melete	9	11 52.36	− 0.70	− 25.09	43 7 56.10	+ 5 41.95	+ 56.8	12 11 26.57	. .	94 20 56.0	− 3.5
	26	B. A. C. 4185	9	19 38.64	+ 0.64	− 25.09	341 21 52.38	+ 4 46.63	− 20.3	12 19 14.19	− 4.19	32 32 39.9	−14.2
	27	B. A. C. 4225	9	25 47.29	− 0.70	− 25.09	43 9 53.10	+ 5 30.82	+ 56.8	12 25 21.50	− 2.19	94 22 41.9	−15.3
	28	f Virginis	9	30 55.28	− 0.71	− 25.09	43 57 56.18	+ 4 13.76	+ 58.4	12 30 29.48	− 2.18	95 9 29.5	−15.4
	29	32^1 Camelopardalis	5	48 42.18	+ 7.04	− 25.08	314 45 53.58	+ 3 49.33	− 1 0.8	12 48 24.14	−17.49	5 55 3.3	−14.5
	30	32^2 Camelopardalis	5	48 49.83	+ 7.04	− 25.08	314 45 53.58	+ 4 7.32	− 1 0.8	12 48 31.79	− 0.22	5 55 21.3	− 1.5
	31	12^2 Canum Venat.	9	50 44.24	+ 0.04	**− 24.99**	359 49 54.98	+ 5 4.23	− 0.1	12 50 19.20	− 0.06	51 1 20.3	+ 1.5
	32	B. A. C. 4389	9	0 48.11	+ 0.22	− 25.08	352 53 54.65	+ 4 35.18	− 7.5	13 0 23.25	− 3.19	41 4 43.5	−18.9
	33	B. A. C. 4417	9	5 40.38	− 1.27	− 25.08	75 53 57.10	+ 4 56.75	+ 3 58.1	13 5 14.03	− 2.12	127 9 13.1	−11.3
	34	Polaris, s. p.	5	13 34.78	−34.51	− 25.07	307 29 52.40	+ 4 34.44	− 1 18.5	1 12 35.20	+ 0.16	358 39 29.5	+ 1.5
	35	38 Cassiopeæ, s. p.	9	22 30.76	− 2.72	− 25.07	288 29 52.80	+ 4 49.37	− 2 58.2	1 22 2.97	+ 0.21	339 38 5.2	+ 1.0
	36	B. A. C. 4509	9	24 32.20	− 0.33	− 25.07	19 7 53.10	+ 4 5.67	+ 21.1	13 24 6.80	− 2.35	70 18 41.1	−19.8
	37	B. A. C. 4562^1	6	35 15.68	− 0.31	− 25.07	18 11 52.48	+ 7 4.99	+ 20.0	13 34 50.30	− 2.32	69 25 38.7	−20.4
	38	B. A. C. 4563	5	35 16.18	− 0.31	− 25.07	18 11 52.48	+ 3 36.27	+ 20.0	13 34 50.80	− 2.33	69 22 10.0	−20.4
	39	B. A. C. 4595	9	41 27.13	+ 0.05	− 25.07	359 39 55.35	+ 6 53.44	− 0.2	13 41 2.11	− 2.70	50 53 9.8	−22.0
	40	B. A. C. 4600	9	42 9.14	+ 0.05	− 25.07	359 39 55.35	+ 4 35.77	− 0.4	13 41 44.12	− 2.70	50 50 51.9	−22.1
	41	50 Cassiopeæ, s. p.	9	53 22.62	− 3.01	− 25.06	290 41 53.10	+ 4 11.96	− 2 38.4	1 52 54.55	+ 0.09	341 49 47.9	+ 2.5
	42	B. A. C. 4674	9	56 21.79	− 1.14	− 25.06	69 51 56.30	+ 4 44.55	+ 2 44.4	13 55 55.59	− 2.03	121 5 46.4	−11.8
	43	ι Cassiopeæ, s. p.	9	19 22.80	− 2.45	− 25.06	285 43 52.68	+ 4 28.10	− 3 31.0	2 18 55.29	+ 0.30	336 51 11.0	+ 1.6
	44	ρ Bootis	9	26 59.13	− 0.13	− 25.05	7 53 54.98	+ 5 16.78	+ 8.5	14 26 33.95	− 2.24	59 5 41.5	−24.0
	45	5 Ursæ Minoris	7	28 16.60	+ 2.67	− 25.05	322 35 52.22	+ 4 23.58	− 46.2	14 27 54.22	− 0.02	13 45 50.8	− 1.6
	46	ε Bootis (r.)	.	. . . .	. .	. .	168 37 52.98	+ 3 52.95	− 12.1	. . . . .	. .	62 24 47.4	+ 1.3
	47	ε Bootis	.	. . . .	. .	. .	11 13 53.10	+ 4 20.98	+ 12.1	. . . . .	. .	62 24 47.4	+ 1.3
	48	B. A. C. 4905 (r.)	.	. . . .	. .	. .	160 39 52.35	+ 3 10.10	− 21.2	. . . . .	. .	70 23 40.0	−23.1
	49	B. A. C. 4905	.	. . . .	. .	. .	19 11 51.50	+ 5 4.95	+ 21.2	. . . . .	. .	70 23 38.8	−23.1
	50	β Ursæ Min. (r.)	.	. . . .	. .	. .	215 39 50.38	+ 4 50.74	+ 43.6	. . . . .	. .	15 20 56.5	− 2.0

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.94	35.3	33.3
29.96	34.3	32.2
29.96	34.3	32.3
29.97	33.6	31.4

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

No. 1 to 50 + 55″.15

5, 6. One bisection.
12, 19. Three bisections.
7. Four bisections.
34. Five bisections.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
1877. Mar. 15	1	β Ursæ Minoris .	.	. . .	. .	. .	324 9 54.55	+ 5 25.72	− 43.6	. . . .	. .	15 20 57.9	−
P.	2	48 Cephei, s. p. .	9	5 12.97	− 4.14	− 25.05	296 7 52.38	+ 4 58.93	− 2 2.5	3 4 43.78	+ 0.17	347 17 10.0	+
	3	γ² Ursæ Min., (R.).	.	. . .	. .	. .	213 17 51.78	+ 3 39.71	+ 39.9	. . . .	. .	17 44 9.8	+
	4	γ² Ursæ Minoris .	3	21 22.80	+ 1.93	− 25.04	326 33 52.12	+ 4 37.89	− 39.9	15 20 59.69	− 0.07	17 44 11.3	+
	5	Lal., (F) 519, s. p.	5	26 51.38	−12.91	− 25.04	305 5 54.00	+ 4 55.74	− 1 25.8	3 26 13.43	+10.31	356 15 45.1	−26
	6	B. A. C. 5199 .	9	39 21.11	− 1.21	− 25.04	73 3 54.15	+ 4 19.81	+ 3 17.6	15 38 54.86	− 1.78	124 17 52.8	−
	7	ε Serpentis . .	9	45 8.38	− 0.54	− **25.07**	33 57 56.10	+ 4 26.23	+ 40.9	15 44 42.81	+ 0.03	85 9 24.4	+
	8	ζ Ursæ Minoris .	5	48 54.84	+ 3.28	− 25.03	320 39 55.75	+ 4 43.65	− 49.5	15 48 33.09	− 0.02	11 50 11.1	+
	9	δ Scorpii . . .	9	53 31.37	− 0.97	− **24 97**	61 3 55.58	+ 4 19.74	+ 1 49.5	15 53 5.37	− 0.02	112 16 26.0	+
	10	β¹ Scorpii . . .	6	58 44.77	− 0.92	− **25.01**	58 15 53.78	+ 4 22.84	+ 1 38.0	15 58 18.82	+ 0.04	109 28 15.8	+
	11	β Scorpii . . .	5	58 45.16	− 0.92	− 25.03	58 15 53.78	+ 4 10.12	+ 1 38.0	15 58 19.21	− 1.61	109 28 3.1	−18
	12	Groom. 2320 .	9	6 25.52	+ 1.45	− 25.03	330 41 54.15	+ 4 46.47	− 33.9	16 6 1.94	+ 0.40	21 52 27.9	+
	13	δ Ophiuchi . .	9	8 21.29	− 0.66	− **25.07**	42 9 54.98	+ 5 41.99	+ 55.0	16 7 55.60	+ 0.06	93 22 53.2	+
	14	α Scorpii . . .	9	22 19 70	− 1.04	− **25.03**	64 55 56.60	+ 5 11.11	+ 2 9.5	16 21 53.64	− 0.01	116 9 38.4	+
	15	A Draconis . .	5	28 39.13	+ 1.56	− 25.02	329 47 53.35	+ 4 48.92	− 35.2	16 28 15.67	+ 0.02	20 58 28.3	+
	16	B. A. C. 1448, s. p.	5	37 55 01	− 5.68	− 25.02	299 49 56.32	+ 4 58.69	− 1 45.1	16 37 24.31	+ 0.01	350 59 31.1	−2
19	17	α Aquarii . . .	9	29 52.79	− 0.87	− **23.99**	39 44 1.88	+ 3 49.39	+ 51.1	. . . .	. .	90 55 3.6	−
20	18	Polaris . . .	5	12 10.82	+46.78	− 23.91	310 9 54.40	+ 5 30.67	− 1 11.6	1 12 33.69	− 0.43	1 20 34.7	+
F.	19	β Arietis . . .	9	48 14.80	− 0.41	− **23.81**	18 35 58.22	+ 4 55.63	+ 20.5	1 47 50.49	− 0.07	69 47 35.5	+
	20	α Arietis . . .	9	0 38.47	− 0.35	− **23.85**	15 55 55.08	+ 4 35.13	+ 17.4	2 0 14.22	− 0.04	67 7 8.8	+
	21	α Ceti	5	56 15.81	− 0.72	− **23.92**	35 11 58.50	+ 4 33.25	+ 42.7	2 55 51.21	+ 0.05	86 23 35.7	+
	22	ζ Persei . . .	9	4 48.40	− 0.12	− **23.85**	7 17 57.22	+ 4 22.95	+ 7.8	3 46 24.42	+ 0.01	58 28 49.2	+
	23	γ¹ Eridani . . .	9	52 42.90	− 1.11	− **23 97**	52 40 0.45	+ 3 56.11	+ 1 18.9	3 52 17.93	+ 0.14	103 51 36.7	+
	24	γ Tauri . . .	9	13 12.48	− 0.51	− **23.79**	23 27 58.55	+ 5 24.07	+ 26.2	4 12 48.11	− 0.05	74 40 10.0	+
	25	ε Tauri . . .	9	21 50.94	− 0.43	− **23.85**	19 53 55.08	+ 4 53.71	+ 21.8	4 21 26.66	+ 0 01	71 5 31.8	+
	26	Moon I, S. . .	9	26 20.66	− 0.25	− 23.85	12 11 54.02	+ 5 38.64	+ 13 1	4 25 56.56	+74.10	63 24 7.0	.
	27	α Tauri . . .	9	29 16.72	− 0 48	− **23.83**	22 33 49.52	+ 3 39.91	+ 25.0	4 28 52.36	+ 0.06	73 44 15.6	+ 1
	28	φ Geminorum. .	9	46 24.07	− 0.32	− **23 67**	11 43 50.68	+ 4 34.97	+ 12.7	7 45 59.96	− 0.18	62 54 59.5	+ 2
	29	B. A. C. 2795 .	8	14 24.02	− 1.72	− 23.78	75 1 55.35	+ 4 55.57	+ 3 45.6	8 13 58.52	− 1.36	126 16 57.7	−12
	30	Lacaille 3325 .	9	22 46.73	− 1.57	− 23.78	70 1 58.02	+ 5 10.93	+ 2 47.0	8 22 21.36	− 1.44	121 16 17.2	−11
	31	ε Hydræ . . .	9	40 42.17	− 0.76	− **23.79**	31 55 55.55	+ 5 2.57	+ 38.1	8 40 17.63	− 0.04	83 7 57.4	+ 2
	32	α Hydræ . . .	9	21 59.39	− 1.05	− **23.87**	46 55 59.08	+ 4 20.42	+ 1 5.2	9 21 34.58	+ 0.09	98 7 45.9	+ 2
23 S.	33	α¹ Geminorum. .	6	27 9.60	− 0.19	− 22.95	6 39 53.55	+ 4 12.09	+ 6.8	7 26 46.66	− 1.92	57 50 33.6	+
	34	α² Geminorum. .	5	27 10.18	− 0.19	− **23.04**	6 39 53.55	+ 4 9.06	+ 6.8	7 26 47.04	+ 0.39	57 50 30 6	+ 2.
	35	α Canis Minoris .	9	33 16.79	− 0.59	− **22 93**	33 15 49.25	+ 4 55.30	+ 37.6	7 32 53.25	− 0.12	84 27 43.4	+
	36	Moon I, N. . .	9	41 22.68	− 0.30	− 22.95	13 27 45.88	+ 4 33.00	+ 13.8	7 40 59.43	+75.20	64 38 53.9	
	37	ε Hydræ . . .	9	40 41.12	− 0.57	− **22.96**	31 55 47.35	+ 5 11.93	+ 36.0	8 40 17.60	− 0.04	83 7 56.5	+
	38	B. A, C. 3030 .	8	48 32.07	− 1.22	− 22.95	76 59 54.40	+ 5 33.21	+ 4 6.0	8 48 7.90	− 1 45	128 15 54.8	−13.
	39	12-y. C. 1879, s. p.	5	53 27.29	− 5.20	− 22.95	298 55 47.62	+ 4 43.09	− 1 43.6	20 52 59.14	+ 0.45	350 5 8.3	+ 3.
	40	B. A. C. 3094 .	9	57 49.48	− 1.24	− 22.95	77 39 55.25	+ 4 50.59	+ 4 19.3	8 57 25.29	− 1.49	128 55 26.3	−13.
	41	Uranus . . .	9	35 21.34	− 0.47	− 22.95	23 37 45.00	+ 3 56.64	+ 25.4	9 34 57.92	. .	74 48 28.2	. .
	42	α Leonis . . .	9	2 14.97	− 0.51	− **22.96**	26 14 . .	. .	. .	10 1 51.51	− 0.03	. . . .	. .
	43	γ¹ Leonis . . .	6	13 37.12	− 0.39	− **22.87**	18 20 . .	. .	. .	10 13 13.78	− 0.06	. . . .	. .
	44	γ² Leonis . . .	5	13 37.40	− 0.39	− 22.95	18 20 . .	. .	. .	10 13 14.06	− 2.48	. . . .	. .
	45	Anonymous .	2	29 17.14	− 0.50	− 22.95	25 1 47.48	+ 4 47.53	+ 27.3	10 28 53.69	− 2.38	76 13 38.5	− 8.
	46	γ Ursæ Majoris .	9	47 47.64	+ 0.35	− 22.95	344 27 49.75	+ 3 33.09	− 16.3	11 47 25.04	− 0.26	35 37 27.7	+ 1.
	47	B. A. C. 4079 .	9	1 19.77	− 0.56	− 22.95	28 27 48.58	+ 4 42.35	+ 31.9	12 0 56.26	− 2.44	79 39 24.0	−14.
	48	B. A. C. 4174 .	9	17 34.04	− 1.20	− 22.95	73 29 56.38	+ 4 28.64	+ 3 16.9	12 17 9.89	− 2.18	124 44 3.1	−11.
	49	β Corvi . . .	9	28 21.92	− 0.99	− **23.02**	61 29 55.12	+ 5 10.04	+ 1 48.3	12 27 57.98	+ 0.08	112 43 14.7	+ 2.
	50	B. A. C. 4268 (R.)	.	. . .	. .	. .	140 15 50.90	+ 4 30.95	− 48.8	. . . .	. .	90 46 48.2	−16.

For summary of the elements of reduction see page 3.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	29.97	32.9	30.9
16	29.98	32.6	30.4
17	30.26	28.4	29.9
18	30.25	34.5	34.8
27	30.20	38.4	39.0
28	30.17	33.0	31.4
32	30.15	33.4	31.2
36	29.88	57.8	56.8
42	29.91	53.0	49.9
46	29.91	49.0	44.5

5, 8, 16, 26, 36. Three bisections.
7. Four bisections.
18. Five bisections.
45. One bisection.
50. Southern component observed.

ZENITH-POINT CORR.

No. 1 to 16 + 55.15″
No. 17 to 27 + 51.34
No. 28 to 32 + 53.98
No. 33 to 50 + 53.12

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	−12 8.0	− 15 48.7	. .	− 27 56.7
36	−13 44.2	+ 16 15.3	. .	+ 2 31.1
41	− 0.2	. .	. .	− 0.2

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
.23	1	B. A. C. 4268	.	. . . .	. . .	. .	39 35 52.30	+ 3 46.35	+ 48.8	. . . .	. .	90 46 48.6	−16.3
S.	2	12^1 Canum Venat.	3	50 41.14	− 0.10	− 22.95	359 49 54.25	+ 5 17.51	− 0.1	12 50 18.09	− 3.05	51 1 32.9	−16.8
	3	12^2 Canum Venat.	8	50 42.41	− 0.10	− **22.92**	359 49 54.25	+ 5 4.79	− 0.1	12 50 19.36	0.00	51 1 20.1	+ 2.6
	4	θ Virginis	9	4 0.88	− 0.76	− **22.92**	43 41 55.78	+ 3 58.98	+ 56.4	13 3 37.17	− 0.07	94 53 12.4	+ 1.6
	5	Polaris, S. P.	5	13 28 58	−32.45	− 22.95	307 29 52.22	+ 4 29.10	− 1 16.4	1 12 33.18	− 0.20	358 39 26.1	+ 0.3
24	6	Polaris	7	12 25.17	+28.39	− 23.01	310 10 . .	. . .	. .	1 12 30.55	− 2.70	. . . .	. .
'.	7	β Arietis	9	48 13.90	− 0.29	− **23.05**	18 36 . .	. . .	. .	1 47 50.60	+ 0.05	. . . .	. .
	8	α Arietis	9	0 37.48	− 0.26	− **22.97**	15 56 . .	. . .	. .	2 0 14.21	− 0.05	. . . .	. .
	9	Lal. (F.) 1794	9	56 12.80	+ 0.62	− 22.90	336 31 48.85	+ 3 14.31	− 25.2	0 55 50.52	− 4.93	27 40 59.2	− 1.9
	10	δ Leonis	9	7 59.69	− 0.33	− **22.82**	17 37 50.00	+ 3 51.10	+ 18.5	11 7 36.46	− 0.13	68 48 20.8	+ 1.8
	11	δ Crateris	9	13 37.30	− 0.70	− **22.92**	52 55 51.75	+ 3 32.40	+ 1 17.0	11 13 13.70	+ 0.02	104 7 2.4	+ 1.7
	12	B. A. C. 3891	9	20 2.19	− 1.00	− 22.90	75 49 56.70	+ 4 25.97	+ 3 47.4	11 19 38.29	− 2.06	127 4 31.3	−14.6
	13	υ Leonis	9	31 4.87	− 0.56	− **22.95**	38 57 53.48	+ 3 54.17	+ 47.1	11 30 41.41	+ 0.02	90 8 55.9	+ 1.5
	14	B. A. C. 3981 (R.)	.	. . .	. .	. .	189 29 54.22	+ 3 48.92	+ 9.8	. . . .	. .	41 32 28.3	− 9.0
	15	B. A. C. 3981	2	39 59.44	+ 0.12	− 22.90	350 21 51.60	+ 4 25.93	− 9.8	11 39 36.66	− 3.65	41 32 28.9	− 9.0
	16	γ Ursæ Maj. (R.)	.	. . .	. .	. .	195 23 53.45	+ 4 46.62	+ 16.1	. . . .	. .	35 37 25.0	− 1.0
	17	γ Ursæ Majoris	4	47 47.90	+ 0.28	− 22.90	344 27 55.68	+ 3 26 78	− 16.1	11 47 25.28	− 0.03	35 37 27.6	+ 1.6
	18	B. A. C. 4079	9	1 19.63	− 0.45	− 22.90	28 27 54.55	+ 4 36.19	+ 31.7	12 0 56.28	− 2.44	79 39 23.6	−14.6
	19	η Virginis (R.)	.	. . .	. .	. .	141 3 54.35	+ 3 58.46	− 46.9	. . . .	. .	89 59 15.3	+ 1.2
	20	η Virginis	.	. . .	. .	. .	38 47 51.88	+ 4 15.03	+ 46.9	. . . .	. .	89 59 15.0	+ 0.9
	21	B. A. C. 4195 (R.)	.	. . .	. .	. .	169 59 52.75	+ 3 31.44	− 10.2	. . . .	. .	61 3 7.2	−14.8
	22	B. A. C. 4195	.	. . .	. .	. .	9 51 53.10	+ 4 43.00	+ 10.2	. . . .	. .	61 3 7.5	−14.8
	23	12^2 Canum Venat.	9	50 42.28	− 0.08	− **22.80**	359 49 56.85	+ 5 1.32	− 0.1	12 50 19.31	− 0.06	51 1 19.3	+ 2.0
	24	B. A. C. 4367	9	56 29.00	− 0.44	− 22.89	27 11 53.38	+ 4 19.30	+ 30.1	12 56 5.67	− 2.42	78 23 4.0	−17.5
	25	θ Virginis	9	4 0.79	− 0.61	− **22.97**	43 41 55.65	+ 3 59.87	+ 55.9	13 3 37.29	+ 0.04	94 53 12.6	+ 1.8
	26	Polaris, S. P.	7	13 20.13	−26.96	− 22.89	307 29 55.52	+ 4 25.78	− 1 15.8	1 12 30.28	− 2.83	358 39 26.7	+ 1.2
	27	α Virginis	9	19 8.68	− 0.67	− **22.91**	49 19 55.15	+ 4 0.32	+ 1 8.1	13 18 45.12	− 0.01	100 31 24.8	+ 1.7
29	28	α Hydræ	9	21 57.05	− 0.97	− **21.70**	46 55 48.68	+ 4 32.12	+ 1 3.2	9 21 34.49	+ 0.09	98 7 45.2	+ 1.3
E.	29	Uranus I	6	34 42.28	− 0.59	− 21.59	23 33 47.30	+ 5 0.13	+ 25.9	9 34 20.10	. .	74 45 34.5	. .
	30	Uranus II	5	34 42.64	− 0.59	− 21.59	23 31 . .	. . .	. .	9 34 20.46	. .	. . . .	. .
	31	ε Leonis	9	39 16.37	− 0.43	− **21.51**	14 27 47.68	+ 5 16.76	+ 15.3	9 38 54.35	− 0.11	65 39 40.9	+ 1.9
	32	α Leonis	9	2 13 72	− 0.64	− **21.61**	26 13 47.80	+ 5 26.01	+ 29.3	10 1 51.50	− 0.01	77 26 4.3	+ 2.0
	33	Weisse (2) 74	9	5 48.92	− 0.51	− 21.58	23 19 49.82	+ 4 32.37	+ 25.6	10 5 26.75	− 2.32	74 31 9.0	− 6.5
	34	Weisse (2) 234	6	13 20.80	− 0.50	− 21.58	18 19 52.82	+ 4 19.80	+ 19.7	10 12 58.72	− 2.44	69 30 53.5	− 5.8
	35	γ^1 Leonis	9	13 35.84	− 0.50	− **21.52**	18 19 52.80	+ 5 47.00	+ 19.7	10 13 13.76	− 0.04	69 32 20.7	+ 2.8
	36	δ Leonis	9	7 58.59	− 0.50	− **21.57**	17 37 49.90	+ 3 50.50	+ 18.9	11 7 36.52	− 0.05	68 48 20.5	+ 2.0
	37	δ Crateris	9	13 36.31	− 1 09	− **21.55**	52 55 49.10	+ 3 34.29	+ 1 18.7	11 13 13.65	− 0.02	104 7 3.3	+ 2.1
	38	Hermione	9	20 42.03	− 0.60	− 21.57	23 41 47.80	+ 5 45.05	+ 26.2	11 20 19.86	. .	74 54 20.2	− 1.2
	39	β Leonis	9	43 11.80	− 0.60	− **21.59**	23 33 48.80	+ 4 3.51	+ 26.0	11 42 49.64	+ 0.02	74 44 39.5	+ 2.2
	40	Thyra	9	52 5.12	− 1.12	− 21.56	54 39 53.85	+ 6 25.15	+ 1 24.2	11 51 42.44	. .	105 54 4.4	− 4.1
	41	Melete	4	0 12.70	− 0.89	− 21.56	41 11 47.10	+ 5 49.78	+ 52.3	11 59 50.25	. .	92 24 50.4	− 3.5
	42	γ Corvi	9	9 53.86	− 1.13	− 21.56	55 39 55.38	+ 4 4.97	+ 1 27.3	12 7 31.17	− 2.22	106 51 48.9	−16.0
	43	β Corvi	9	28 20.80	− 1.24	- **21.62**	61 29 55.40	+ 5 9.09	+ 1 49.9	12 27 58.01	+ 0.08	112 43 15.6	+ 2.6
	44	12^1 Canum Venat.	5	50 39.74	− 0.13	− 21.55	359 49 53.50	+ 5 16.83	− 0.1	12 50 18.06	− 3.10	51 1 31.4	−15.6
	45	12^2 Canum Venat.	5	50 41.04	− 0.13	− **21.47**	359 49 53.50	+ 5 3.20	− 0.1	12 50 19.36	− 0.05	51 1 17.8	+ 1.5
	46	Polaris, S. P.	5	13 31.98	−38.73	− 21.54	307 29 54.05	+ 4 27.20	− 1 17.7	1 12 31.71	− 0.43	358 39 24.7	+ 0.8
	47	Moon II, S.	9	20 59.63	− 1.08	− 21.54	52 1 52.18	+ 4 52.35	+ 1 16.8	13 20 37.01	−68.18	103 14 22.5	. .
30	48	Sun I. N.	9	36 28.34	− 0.85	− 21.36	34 32 0.30	+ 4 31.95	+ 40.5	0 36 6.13	. .	85 43 33.9	. .
'.	49	Sun II, S.	9	38 37.32	− 0.85	− 21.36	35 3 57.75	+ 4 36.30	− 41.2	0 38 15.11	. .	86 15 36.4	. .
	50	Polaris	5	12 9.62	+40.27	− 21.36	310 9 59.55	+ 5 25.94	− 1 9.0	1 12 28.53	+ 3.59	1 20 37.7	+ 1.4

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.91	47.3	43.1
30.06	54.4	52.7
30.06	53.3	51.0
30.05	52.2	49.7
29.91	43.0	42.5
29.99	38.5	37.0
30.21	47.3	50.5

For summary of the elements of reduction see page 3.

1. Southern component observed.
5. Three bisections.
26, 47, 50. Five revolutions.
10. Four revolutions.

ZENITH-POINT CORR.

No. 1 to 5 + 53.″12
No. 9 to 27 + 53.70
No. 28 to 47 + 54.90
No. 48 to 50 + 50.26

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
29	− 0.2	. . .	. .	− 0.2
47	−46 16.6	− 16 3.8	. .	− 62 20.4
48	− 5.0	+ 16 1.2	. .	+ 15 56.2
49	− 5.1	− 16 1.2	. .	− 16 6.3

DATE AND OBS'R.	Number.	OBJECT.	Thread.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
1877. Mar. 30	1	η Piscium	9	25 16.02	− 0.66	**−[21.44**	24 6 . .	. .	. .	1 24 54.00	+ 0.16	. . . .	.
F.	2	β Arietis	9	48 12.43	− 0.56	**− 21.31**	18 35 46.42	+ 5 7.57	+ 19.7	1 47 56.51	− 0.03	69 47 34.9	+ 2
	3	α Arietis	9	0 36.09	− 0.51	**− 21.34**	15 55 49.00	+ 4 42.06	+ 16.7	2 0 14.22	− 0.01	67 7 9.0	+ 3
	4	α Ceti	9	56 13.27	− 0.84	**− 21.34**	35 11 52.20	+ 4 41.71	+ 41.0	2 55 51.07	− 0.01	86 23 36.1	+ 1
	5	κ Cancri	9	1 29.01	− 0.64	**− 21.36**	27 39 49.32	+ 3 40.86	+ 31.3	9 1 7.01	+ 0.03	78 50 22.7	+ 3
	6	Lalande 18067	9	3 5.99	− 1.11	− 21.35	53 25 49.45	+ 5 11.65	+ 1 20.5	9 2 43.53	− 1.63	104 38 42.8	−10
	7	Bradley 1321	9	18 13.86	− 0.47	− 21.35	18 29 49.32	+ 4 44.89	+ 20.1	9 17 52.04	− 2.21	69 41 15.5	− 1
	8	α Hydræ	9	21 56.71	− 0.99	**− 21.35**	46 55 45.70	+ 4 36.23	+ 1 4.0	9 21 34.37	− 0.02	98 7 47.1	+ 3
	9	μ Leonis	9	46 10.09	− 0.34	**− 21.34**	12 13 49.42	+ 4 33.28	+ 13.0	9 45 48.41	+ 0.04	63 24 56.9	+ 2
	10	B. A. C. 3452	3	0 39.56	− 1.44	− 21.33	69 3 49.00	+ 5 6 70	+ 2 36.1	10 0 16.79	− 1.75	120 17 53.0	−14
	11	α Leonis	9	2 13.44	− 0.'2	**− 21.36**	26 13 48.05	+ 5 25.84	+ 29.6	10 1 51.49	− 0.01	77 26 4.7	+ 2
	12	32 Ursæ Majoris	3	9 30.39	+ 1.40	− 21.32	333 5 48.45	+ 5 2.18	− 30.3	10 9 10.47	+ 0.44	24 16 41.5	+ 1
	13	γ^1 Leonis	9	13 35.48	− 0.48	**− 21.19**	18 19 49.08	+ 5 51.53	+ 20.0	10 13 13.68	− 0.11	69 32 21.8	+ 4
	14	Freia	9	58 24.04	− 0.77	− 21.30	34 11 48.30	+ 5 19.07	+ 41.0	10 58 1.97	. .	85 24 9.6	− 2
	15	Hermione	9	20 5.86	− 0.58	− 21.28	23 39 50.20	+ 5 23.36	+ 26.5	11 19 44.00	. .	74 52 1.3	− 1
	16	β Leonis	9	43 11.50	− 0.58	**− 21.31**	23 33 47.30	+ 4 5.68	+ 26.4	11 42 49.65	+ 0.03	74 44 40.6	+ 3
	17	Thyra	9	51 6.02	− 1.14	− 21.27	54 35 50.15	+ 5 30.09	+ 1 25.2	11 50 43.61	. .	105 49 6.6	− 4
	18	Melete	9	59 22.89	− 0.89	− 21.26	41 3 48.28	+ 5 17.97	+ 52.8	11 59 0.74	. .	92 16 20.2	− 3
	19	η Virginis	9	14 1.26	− 0.85	**− 21 25**	38 47 49.82	+ 4 15.47	+ 48.8	12 13 39.16	− 0.01	89 59 15.3	+ 1
	20	Anonymous	9	24 48.32	− 1.05	− 21.25	49 25 51.02	+ 7 18.42	+ 1 10.9	12 24 26.02	− 2.27	100 40 41.5	−16
	21	Cyrene	9	46 9.52	− 1.13	− 21.24	53 29 52.55	+ 5 12.22	+ 1 22.0	12 45 47.15	. .	104 42 18.0	− 4
	22	Polaris, S. P.	5	13 32.98	−43.31	− 21.22	307 29 50.62	+ 4 31.18	− 1 18.7	1 12 28.45	− 3.67	358 39 24.3	+ 0
	23	α Virginis	9	19 7.37	− 1.05	**− 21.15**	49 20 . .	. .	. .	13 18 45.10	− 0.10	. . . .	.
	24	ζ Virginis	9	28 49.89	− 0.87	**− 21.10**	38 46 . .	. .	. .	13 28 27.80	− 0.13	. . . .	.
	25	Echo	9	31 56.51	− 1.02	− 21.21	47 35 51.10	+ 5 59.90	+ 1 6.6	13 31 34.28	. .	98 49 18.8	− 4
	26	Moon II, S.	9	15 15.09	− 1.22	− 21.17	57 55 51.58	+ 6 11.75	+ 1 37.1	14 14 52.70	−69.24	109 10 1.5	.
	27	α^2 Libræ	9	44 29.19	− 1.16	**− 21.28**	54 19 56.48	+ 4 22.47	+ 1 24.8	14 44 6.87	+ 0.12	105 32 5.0	+ 3
Apr. 3	28	Sun, N.	.	. . .	. .	. .	32 59 55.78	+ 4 20.15	+ 38.6	. . . .	. .	84 11 15.7	.
	29	Sun, S.	.	. . .	. .	. .	33 31 53.22	+ 4 24.65	+ 39.4	. . . .	. .	84 43 18.5	.
	30	Polaris	.	. . .	. .	. .	310 9 51.65	+ 5 37.29	− 1 9.8	. . . .	. .	1 20 40.3	+ 2
5	31	Uranus	9	34 3.47	− 0.50	− 18.67	23 31 52.10	+ 4 13.14	+ 25.7	9 33 44.30	. .	74 42 52.1	.
P.	32	ε Leonis	9	39 13.38	− 0.35	**− 18.67**	14 27 49.15	+ 5 13.59	+ 15.3	9 38 54.36	− 0.03	65 39 39.2	+ 0
	33	79 Draconis, S. P.	9	51 38.51	− 3.39	− 18.66	291 59 53.52	+ 3 11.89	− 2 24.4	21 51 16.46	+ 0.53	343 7 2.2	+ 3
	34	α Leonis	9	2 10.60	− 0.54	**− 18.66**	26 13 51.85	+ 5 20.87	+ 29.2	10 1 51.41	− 0.03	77 26 3.1	+ 1
	35	γ^1 Leonis	9	13 32.84	− 0.42	**− 18.66**	18 19 54.35	+ 5 44.64	+ 19.6	10 13 13.77	+ 0.03	69 32 19.8	+ 2
	36	30 (H.) Camelop.	5	16 22.52	+ 6.12	− 18.65	315 39 54.75	+ 3 35.26	− 57.4	10 16 9.99	−15.15	6 48 53.8	+ 9
	37	B. A. C. 7851, S. P.	5	22 59.23	−11.02	− 18.64	304 19 55.82	+ 4 16.63	− 1 25.9	22 22 29.57	+20.26	355 29 7.7	+10
	38	ο Cephei, S. P.	9	13 53.07	− 2.66	− 18.62	2·6 19 53.78	+ 3 17.49	− 3 18.4	23 13 31.79	+ 0.24	337 26 14.1	+ 2
	39	B. A. C. 3891	9	19 58.08	− 1.36	− 18.61	75 49 58.00	+ 4 24.07	+ 3 51.3	11 19 38.11	− 2.03	127 4 34.6	−17
	40	Anonymous	9	27 2.51	− 0.60	− 18.61	30 25 56.00	+ 6 24.98	+ 34.9	11 26 43.30	− 2.38	81 39 17.1	−12
	41	γ Cephei, S. P.	5	34 25.22	− 4.22	− 18.61	295 47 54.85	+ 4 28.43	− 2 1.3	23 34 12.39	+ 0.54	346 56 43.2	+ 0
	42	Thyra	9	45 28.09	− 0.95	− 18.60	54 3 56.40	+ 5 8.47	+ 1 21.7	11 45 8.54	. .	105 16 47.8	− 4
	43	Groom. 4163, S. P.	9	49 9.12	− 3.50	− 18.60	292 35 50.75	+ 3 41.75	− 2 20.9	23 48 47.02	+ 0.18	343 43 32.8	+ 2
	44	Melete	9	54 34.16	− 0.74	− 18.60	40 13 53.42	+ 4 41.57	+ 50.2	11 54 14.82	. .	91 25 46.4	− 3
	45	4 Draconis (R.)	.	. . .	. .	. .	219 19 54.05	+ 3 34.72	+ 48.6	. . . .	. .	11 42 3.8	− 2
	46	4 Draconis	6	6 50.19	+ 3.29	− 18.59	320 31 55.72	+ 4 39.09	− 48.6	12 6 34.89	− 0.23	11 42 7.4	+ 0
	47	κ Draconis (R.)	.	. . .	. .	. .	211 29 53.50	+ 3 42.91	+ 36.4	. . . .	. .	19 32 8.4	− 1
	48	κ Draconis	9	28 36.79	+ 1.61	− 18.58	328 21 54.42	+ 4 30.07	− 36.4	12 28 19.82	− 0.02	19 32 9.3	− 0
	49	Cyrene	9	41 7.12	− 0.93	− 18.57	53 9 56.08	+ 6 11.27	+ 1 19.4	12 40 47.62	. .	104 23 48.0	− 4
	50	12^2 Canum Venat.	9	50 38.09	− 0.04	**− 18.57**	359 49 55.75	+ 4 59.55	− 0.1	12 50 19.48	+ 0.03	51 1 16.4	+ 1

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	30.13	55.0	54.8
5	30.25	47.0	42.8
15	30.30	43.0	38.5
18	30.32	41.5	36.8
22	30.30	40.5	35.2
27	30.30	39.0	34.0
29	30.19	40.0	44.6
30	30.20	45.8	45.5
31	29.79	43.5	42.0
37	29.79	42.6	40.6
41	29.78	41.4	39.4

For summary of the elements of reduction see page 3.

12. One bisection.
22, 30. Five bisections.
36, 37. Three bisections.
50. Four bisections.

ZENITH-POINT CORR.

No. 2 to 4 + 50″.26
No. 5 to 27 + 54.50
No. 28 to 30 + 53.99
No. 31 to 50 + 54.21

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	−49 6.3	− 15 56.9	. .	− 64 57.2
28	− 4.8	+ 16 1.4	. .	+ 16 56.6
29	− 4.8	− 16 1.4	. .	− 16 6.2
31	− 0.2	. .	. .	− 0.2

TE D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
'7.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
. 5	1	B. A. C. 4417 .	9	5 34.40	− 1.35	− 18.56	75 53 57.82	+ 5 4.53	+ 3 53.9	13 5 14.49	− 2.39	127 9 17.5	−16.2
.	2	Polaris, s. p. .	6	13 26.20	−35.63	− 18.55	307 29 55.10	+ 4 24.23	− 1 17.1	1 12 32.02	− 0.34	358 39 23.4	+ 1.6
	3	Echo	9	26 31.20	− 0.83	− 18.54	46 53 54.70	+ 5 23.48	+ 1 3.8	13 26 11.83	. .	98 6 43.2	− 4.6
.	4	α Aquarii . . .	9	59 47.62	− 0.74	**− 18.59**	39 43 51.08	+ 4 6.83	+ 48.4	21 59 28.36	+ 0.09	90 55 7.5	+ 2.5
	5	α Pegasi . . .	9	58 56.94	− 0.52	**− 18.44**	24 15 46.65	+ 4 55.75	+ 26.2	22 58 37.93	− 0.03	75 27 29.8	+ 3.4
	6	α Andromedæ .	6	2 20.12	− 0.28	**− 18.43**	10 24 . .	. . .	. .	0 2 1.38	0.00	. . . .	. .
	7	Polaris . . .	5	12 14.72	+35.73	− 18.43	310 9 53.10	+ 5 34.34	− 1 7.9	1 12 32.02	− 0 34	1 20 40.7	+ 2.3
6	8	ε Hydræ . . .	9	40 36.30	− 0.66	**− 18 24**	31 55 51.92	+ 5 9.15	+ 36.1	8 40 17.43	− 0.02	83 7 58.4	+ 3.7
	9	ι Ursæ Maj. (R.) .	3	. . .	. .	. .	159 33 41.50	+ 4 2.95	+ 9.8	. . . .	. .	41 28 27.0	− 1.1
	10	ι Ursæ Majoris .	3	51 7.50	+ 0.15	− 18.20	350 17 44.08	+ 4 33.79	− 9.8	8 50 49.45	− 0.04	41 28 29.3	+ 1.2
	11	κ Cancri . . .	9	1 25.71	− 0.60	**− 18.18**	27 39 52.00	+ 3 40.35	+ 30.4	9 1 6.91	+ 0.01	78 50 24.0	+ 5.0
	12	ι Hydræ . . .	9	21 53.33	− 0.87	**− 18.17**	46 55 52.25	+ 4 32.35	− 1 2.1	9 21 34.27	− 0.04	98 7 47.9	+ 3.6
	13	Uranus I, C. .	6	33 58.45	− 0.55	− 18.18	23 31 45.82	+ 4 1.42	+ 25.4	9 33 39.72	. .	74 42 33.8	. .
	14	Uranus II . .	5	33 58.78	− 0.55	− 18.18	23 32 . .	. . .	. .	9 33 40.05	. .	. . . .	. .
	15	α Leonis (R.) . .	.	. . .	. .	. .	153 35 47.22	+ 4 59.52	− 28.8	. . . .	. .	77 26 3.3	+ 1.3
	16	α Leonis . . .	.	. . .	. .	. .	26 13 47.92	+ 5 26.06	+ 28.8	. . . .	. .	77 26 4.0	+ 2.0
	17	ε Delphini . .	9	27 39.41	− 0.65	**− 17.93**	27 55 48.55	+ 4 24.04	+ 31.5	20 27 20.90	+ 0.13	79 7 5.3	+ 3.2
	18	α Cygni . . .	9	37 31.97	− 0.02	**− 17.81**	353 57 44.90	+ 5 53.39	− 6.2	20 37 14.09	− 0.01	45 9 53.3	+ 2.7
	19	ζ Cygni . . .	9	8 0.32	− 0.35	**− 17.83**	9 5 47.30	+ 4 35.54	+ 9.5	21 7 42.12	+ 0.01	60 16 53.5	+ 2.0
'.	20	α Andromedæ .	9	2 19.59	− 0.27	**− 17.90**	10 23 47.52	+ 5 1.87	− 10.7	0 2 1.35	− 0.04	61 35 21.3	+ 0.6
	21	γ Pegasi . . .	9	7 12.51	− 0.50	**− 18.04**	24 17 47.50	+ 5 29.14	+ 26.4	0 6 54.04	+ 0.08	75 30 4.2	+ 2.7
7	22	Sun I, S.. . .	9	5 33.99	− 0.61	− 17.95	32 1 55.02	+ 3 37.82	+ 36.0	1 5 15.43	. .	83 12 30.0	. .
	23	Sun II, N. . .	9	7 43.28	− 0.61	− 17.95	31 29 56.38	+ 3 36.90	+ 35.3	1 7 24.72	. .	82 40 29.8	. .
	24	Polaris . . .	6	12 12.92	+35.93	− 17.95	310 9 53.85	+ 5 33.36	− 1 7.7	1 12 30.90	− 1.43	1 20 40.7	+ 2.1
	25	B. A. C. 962 . .	9	0 28.93	+ 0.29	− 17.91	349 39 48.58	+ 5 19.28	− 10.3	3 0 11.31	+ 0.66	40 51 18.8	+12.8
	26	ζ Persei . . .	9	46 42.38	− 0.16	**− 18 00**	7 17 46.82	+ 4 34.83	+ 7.4	3 46 24.33	+ 0.13	58 28 50.2	+ 1.1
	27	γ Tauri . . .	4	13 6.29	− 0.45	**− 17.87**	23 27 46.12	+ 5 37.77	+ 24.8	4 12 47.96	+ 0.01	74 40 9.9	+ 2.5
	28	ε Tauri . . .	5	21 44.70	− 0.39	**− 17.87**	19 53 47.85	+ 5 3.18	+ 20.7	4 21 26.43	0.00	71 5 32.9	+ 3.8
	29	α Tauri . . .	9	29 10.47	− 0.43	**− 17.87**	22 33 49.80	+ 3 42.43	+ 23.7	4 28 52.17	− 0.01	73 44 17.1	+ 2.9
	30	9 Camelopardalis	9	42 6.49	+ 1.26	− 17.87	332 41 47.45	+ 4 9.90	− 29.2	4 41 49.88	+ 0.23	23 51 49.4	+ 1.4
	31	ι Aurigæ . . .	8	49 17.44	− 0.14	**− 17.78**	5 49 52.05	+ 5 20.33	+ 5.9	4 48 59.43	− 0.11	57 1 39.5	+ 2.3
	32	B. A. C. 3009 .	7	45 24.87	- 1.38	− 17.79	78 35 44.58	+ 5 15.35	+ 4 41.6	8 45 5.70	− 1.11	129 52 2.7	−15.4
	33	Abo 185 . . .	9	56 59.27	+ 0.31	− 17.78	347 35 48.12	+ 3 10.37	− 12.8	8 56 41.80	− 2.96	38 41 6.9	+ 9.8
	34	Lal. (F.) 1457 .	6	6 19.47	+ 0.39	− 17.78	345 35 47.05	+ 5 16.01	− 14.8	9 6 2.08	− 3.15	36 47 9.5	+ 9.6
	35	Lal. (F.) 1458 .	5	6 21.33	+ 0.39	− 17.78	345 35 47.05	+ 5 6.01	− 14.8	9 6 3.94	− 3.15	36 46 59.5	+ 9.6
	36	Uranus . . .	9	33 53.92	− 0.50	− 17.77	23 35 47.30	− 19.35	+ 25.5	9 33 35.65	. .	74 42 14.7	. .
	37	Camilla . . .	7	36 8.22	− 0.59	− 17.77	28 43 50.95	+ 5 27.13	+ 32.1	9 35 49.86	. .	79 56 11.4	− 1.6
	38	Weisse(2)1106(?)	9	53 50.42	− 0.46	− 17.76	20 45 50.80	+ 4 38.72	+ 22.2	9 53 32.20	− 2.24	71 57 12.9	− 4.5
	39	α Leonis . . .	9	2 9.61	− 0.55	**− 17.68**	26 13 47.32	+ 5 26.51	+ 28.9	10 1 51.30	− 0.12	77 26 3.9	+ 1.9
	40	l Leonis . . .	9	43 8.11	− 0.57	**− 17.76**	27 37 50.42	+ 3 43.83	+ 30.8	10 42 49.80	+ 0.05	78 48 26.2	+ 1.9
	41	δ Crateris . . .	9	13 32.39	− 0.94	**− 17.81**	52 55 56.25	+ 3 28.27	+ 1 17.9	11 13 13.72	+ 0.08	104 7 3.6	+ 1.5
	42	υ Leonis . . .	9	30 59.91	− 0.75	**− 17.80**	38 57 50.58	+ 3 57.15	+ 47.7	11 30 41.43	+ 0.04	90 8 56.6	+ 2.0
	43	ο Virginis . . .	9	59 17.38	− 0.61	**− 17.72**	29 23 48.62	+ 4 33.41	+ 33.3	11 58 59.05	− 0.04	80 35 16.5	+ 1.6
	44	Lalande 22954 .	9	9 11.73	− 0.88	− 17.72	48 23 52.92	+ 4 35.06	+ 1 6.6	12 8 53.13	− 2.28	99 35 55.8	−16.5
	45	12 Canum Venat. .	9	50 37.17	− 0 09	**− 17.59**	359 49 52.52	+ 5 3.53	− 0.1	12 50 19.38	− 0.08	51 1 17.1	+ 2.7
	46	θ Virginis . . .	9	3 55.87	− 0.82	**− 17.72**	43 41 54.48	+ 4 2.26	+ 56.6	13 3 37.35	− 0.02	94 53 14.5	+ 3.0
	47	Polaris, s. p. .	5	13 27.78	−35.07	− 17.69	307 29 48.48	+ 4 28.81	− 1 16.8	1 12 35.02	+ 2.72	358 39 21.7	+ 0.5
10	48	ι Piscium . . .	9	33 54.50	− 0.78	**− 16.22**	33 49 57.20	+ 5 31.41	+ 38.8	23 33 37.53	0.00	85 2 28.6	+ 2.6
	49	B. A. C. 8268 .	9	41 16.77	+ 0.55	− 16.10	340 51 50.92	+ 4 13.11	− 19.9	23 41 1.13	+ 1.93	32 2 5.3	− 4.7
	50	ω Piscium . . .	9	53 16.66	− 0.76	**− 16.17**	32 38 . .	. . .	. .	23 52 59.71	− 0.02	. . . .	. .

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.78	39.0	36.7
29.88	47.5	49.0
29.93	54.0	53.5
29.96	52.0	49.5
30.03	42.5	42.0
30.04	54.0	55.6
30.01	55.6	57.8
29.96	61.4	62.8
29.96	53.0	51.2
29.96	48.8	45.4
29.95	45.0	43.2
29.95	44.5	42.2
29.96	45.0	41.8
29.98	53.2	55.4

For summary of the elements of reduction see page 3.

29. Four bisections.
2, 24, 47. Five bisections.

ZENITH-POINT CORR.

No. 1 to 3 + 54.21
No. 4 to 7 + 54.09
No. 8 to 16 + 55.13
No. 17 to 19 + 55.63
No. 20 to 31 + 52.78
No. 32 to 47 + 53.14
No. 48 to 49 + 52.81

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
13	− 0.2	. . .	. .	− 0.2
22	− 4.7	− 16 0.1	. .	− 16 4.8
23	− 4.6	+ 16 0.1	. .	+ 15 55.5
36	− 0.2	. . .	. .	− 0.2

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Apr. 10	1	α Andromedæ	9	2 18.01	− 0.39	− **16.14**	10 23 52.60	+ 4 59.81	+ 10.6	0 2 1.43	− 0.02	61 35 24.2	+ 3
F.	2	γ Pegasi	9	7 10.90	− 0.64	− **16.23**	24 17 49.55	+ 5 26.84	+ 26.1	0 6 54.08	+ 0.06	75 30 3.7	+ 2
	3	Polaris	4	12 9.58	+37.97	− 16.16	310 9 52.05	+ 5 35.69	− 1 7.5	1 12 31.39	− 0.94	1 20 41.4	+ 1
11	4	Sun I, N.	9	20 12.08	− 0.72	− 16.16	29 59 54.72	+ 4 47.31	+ 33.1	1 19 55.20	. .	81 11 36.3	.
	5	Sun II, S.	9	22 21.69	− 0.72	− 16.16	30 31 52.02	+ 4 47.81	+ 33.8	1 22 4.81	. .	81 43 34.8	.
	6	δ Persei	9	34 26.17	+ 0.14	− 16.11	351 25 49.12	+ 4 12.57	− 8.5	3 34 10.20	+ 0.32	42 36 14.4	− 0
	7	η Tauri	9	40 27.07	− 0.44	− **16.11**	15 5 48.25	+ 4 3.59	+ 15.4	3 40 10.52	+ 0.01	66 16 28.4	+ 1
	8	ζ Persei	.	. . .	. .	. .	7 17 46.70	+ 4 36.12	+ 7.3	. . . .	. .	58 28 51.3	+ 1
	9	γ¹ Eridani	.	. . .	. .	. .	52 39 55.22	+ 4 5.64	+ 1 14.4	. . . .	. .	103 51 36.5	+ 4
	10	α Tauri	9	29 8.80	− 0.56	− **16.11**	22 33 46.48	+ 3 47.13	+ 23.6	4 28 52.15	+ 0.01	73 44 18.4	+ 4
	11	ι Aurigæ	9	49 15.83	− 0.24	− **16.08**	5 49 53.30	+ 5 19.85	+ 5.9	4 48 59.50	+ 0.01	57 1 40.3	+ 2
	12	ε Hydræ	9	40 34.14	− 0.62	− **16.19**	31 55 51.18	+ 5 10.23	+ 35.8	8 40 17.36	− 0.02	83 7 58.4	+ 3
	13	B. A. C. 3024	9	47 41.10	− 1.52	− 16.16	79 15 52.35	+ 4 36.74	+ 4 55.3	8 47 23.42	− 1.03	130 31 45.6	−16
	14	Abo 185	9	56 57.57	+ 0.49	− 16.16	347 31 52.15	+ 3 8.25	− 12.6	8 56 41.90	− 2.87	38 41 9.0	+10
	15	κ Cancri	9	1 23.61	− 0.54	− **16.21**	27 39 55.22	+ 3 36.11	+ 30.2	9 1 6.91	+ 0.08	78 50 22.7	+ 3
	16	Lalande 18067	9	3 0.66	− 0.98	− 16.16	53 25 51.38	+ 5 14.44	+ 1 17.6	9 2 43.52	− 1.47	104 38 44.6	−11
	17	Lal., (F.) 1457	6	6 17.84	+ 0.62	− 16.16	345 35 47.80	+ 5 16.25	− 14.7	9 6 2.30	− 3.05	36 47 10.5	+10
	18	Lal., (F.) 1458	3	6 19.76	+ 0.62	− 16.16	345 35 47.80	+ 5 5.40	− 14.7	9 6 4.22	− 3.05	36 46 59.7	+10
	19	B. A. C. 3254¹	6	25 48.72	− 1.30	− 16.16	70 5 52 45	+ 6 27.86	+ 2 38.7	9 25 31.26	− 1.39	121 21 20.2	−15
	20	B. A. C. 3254²	5	25 49.16	− 1.30	− 16.16	70 5 52.45	+ 6 20.42	+ 2 38.7	9 25 31.70	− 1.39	121 21 12.8	−15
	21	B. A. C. 3262	9	26 35.51	− 1.30	− 16.16	70 5 52.45	+ 5.16.03	+ 2 38.6	9 26 18.05	− 1.39	121 20 8.3	−15
	22	Uranus	9	33 37.38	− 0.47	− 16.16	23 29 53.08	+ 4 32.25	+ 25.2	9 33 20.75	. .	74 41 11.7	.
	23	Camilla	9	36 22.24	− 0.56	− 16.16	28 31 52.28	+ 5 30.35	+ 31.5	9 36 5.52	. .	79 44 15.3	− 1
	24	Durch. 17°, 2160	9	2 11.62	− 0.43	− 16.16	21 31 47.22	+ 4 56.89	+ 22.9	9 51 55.03	− 2.17	72 43 28.2	− 4
	25	Weisse (2) 1236.	9	59 19.17	− 0.45	− 16.16	22 27 47.22	+ 4 18.33	+ 24.0	9 59 2.56	− 2.18	73 38 50.8	− 5
	26	α Leonis	9	2 7.99	− 0.53	− **16.12**	26 13 41.98	+ 5 34.61	+ 28.6	10 1 51.30	− 0.08	77 26 6.4	+ 4
	27	γ¹ Leonis	6	13 30.25	− 0.38	− **16.17**	18 19 53.72	+ 5 47.95	+ 19.3	10 13 13.71	+ 0.03	69 32 22.2	+ 5
	28	γ² Leonis	5	13 30.54	− 0.38	− 16.16	18 19 53.72	+ 5 49.21	+ 19.3	10 13 14.00	− 2.33	69 32 23.4	− 4
	29	ρ Leonis	9	26 38.91	− 0.57	− **16.11**	28 51 50.65	+ 5 7.42	+ 32.1	10 26 22.18	− 0.09	80 3 51.4	+ 3
	30	l Leonis (R.)	.	. . .	. .	. .	152 13 47.45	+ 4 37.89	− 30.6	. . . .	. .	78 48 26.5	+ 2
	31	l Leonis	.	. . .	. .	. .	27 37 50.30	+ 3 44.53	+ 30.6	. . . .	. .	78 48 26.6	+ 2
	32	α Ursæ Maj., (R.)	.	. . .	. .	. .	203 25 46.58	+ 5 4.91	+ 25.4	. . . .	. .	27 35 4.3	− 1
	33	α Ursæ Majoris	.	. . .	. .	. .	336 23 47.62	+ 5 23.60	− 25.4	. . . .	. .	27 35 7.0	+ 1
	34	Thyra	5	40 27.03	− 0.99	− 16.16	53 27 49.60	+ 6 47.89	+ 1 19.1	11 40 9.88	. .	104 42 17.8	− 4
	35	Melete	5	50 11.37	− 0.76	− 16.16	39 23 50.62	+ 6 28.88	+ 48.2	11 49 54.45	. .	90 37 28.9	− 3
	36	ο Virginis	9	59 15 81	− 0.59	− **16.17**	29 23 46.10	+ 4 37.10	+ 33.1	11 58 59.06	− 0.03	80 35 17.5	+ 2
	37	B. A. C. 4209	9	23 37.02	− 0.31	− 16.15	14 1 50.60	+ 4 24.52	+ 14.7	12 23 20.56	− 2.76	65 12 51.0	−12
	38	B. A. C. 4225	9	25 38.68	− 0.82	− 16.15	43 9 52.65	+ 5 35.25	+ 55.1	12 25 21.71	− 2.36	94 22 44.2	−16
	39	Cyrene	9	36 10.58	− 0.98	− 16.15	52 47 51.58	+ 6 11.47	+ 1 17.3	12 35 53.45	. .	104 1 41.5	− 4
	40	Lalande 23951	9	45 20 98	− 0.96	− 16.15	51 37 52.85	+ 3 29.04	+ 1 14.0	12 45 3.87	− 2.34	102 48 57.1	−17
	41	Polaris, S. P.	5	13 29.98	−42.38	− 16.15	307 29 52.22	+ 4 23.22	− 1 16.0	1 12 31.45	− 0.95	358 39 20.6	+ 0
	42	α Draconis (R)	.	. . .	. .	. .	205 59 51.15	+ 3 38.12	+ 28.6	. . . .	. .	25 2 23.3	− 4
	43	α Draconis	3	1 23.08	+ 1.31	− 16.15	333 51 50.40	+ 4 44.52	− 28.6	14 1 8.24	− 0.09	25 2 27.5	+ 0
	44	α Bootis	9	10 22.21	− 0.42	− **16.11**	18 59 52.05	+ 4 23.52	+ 20.2	14 10 5.64	− 0.02	70 10 57.0	+ 3
	45	α² Libræ	7	44 24.16	− 1.02	− **16.18**	54 19 56.50	+ 4 27.11	+ 1 21.6	14 44 6.99	+ 0.03	105 32 6.4	+ 4
S.	46	ζ Pegasi	9	35 36.26	− 0.73	− **15.70**	28 37 49.98	+ 4 0.26	+ 31.6	22 35 19.82	+ 0.08	79 48 43.0	+ 1
	47	ι Cephei	9	45 30.29	+ 1.23	− 15.71	333 15 48.65	+ 5 15.27	− 28.9	22 45 15.81	+ 0.24	24 26 56.2	− 1
	48	α Piscis Aust.	9	51 8.77	− 1.44	− **15.76**	69 3 51.80	+ 3 35.39	+ 2 29.8	22 50 51.62	+ 0 06	120 16 18.2	− 1
	49	α Pegasi	9	58 54.43	− 0.65	− **15.68**	24 15 49.35	+ 4 51.35	+ 26.0	22 58 38.07	− 0.01	75 27 27.9	+ 1

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
5	29.96	56.3	58.7
11	29.90	60.6	63.8
12	29.90	58.4	56.5
33	29.90	53.5	47.8
38	29.93	51.2	46.0
46	29.95	49.4	46.8
49	29.99	52.8	56.2

For summary of the elements of reduction see page 3.

3. One bisection.
41. Five bisections.

ZENITH-POINT CORR.

No. 1 to 11 + 52.″81
No. 12 to 45 + 53.36
No. 46 to 49 + 52.40

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	− 4.4	+ 15 59.2	. .	+ 15 55.8
5	− 4.5	− 15 59.2	. .	− 16 3.7
22	− 0.2	. .	. .	− 0.2

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
11	1	Venus II, N.	9	3 6.81	− 0.80	− 15.72	33 33 50.85	+ 3 37.87	+ 37.9	1 2 50.29	− 0.33	84 44 27.8	. .
	2	Venus S.	.	. .	. .	. .	33 33 50.85	+ 3 46.13	+ 38.0	. . . .	. .	84 44 36.2	. .
	3	Polaris	5	12 4.32	+41.32	− 15.72	310 9 48.90	+ 5 38.03	− 1 7.3	1 12 29.92	− 2.54	1 20 40.8	+ 0.5
12	4	Sun I, N.	9	23 52.49	− 0.73	− 15.72	29 37 48.42	+ 5 0.94	+ 32.5	1 23 36.04	. .	80 49 43.1	. .
	5	Sun II, S.	9	26 2.04	− 0.73	− 15.72	30 9 52.75	+ 4 53.15	+ 33.2	1 25 45.59	. .	81 21 40.3	. .
	6	Mercury I, C.	9	50 50.41	− 0.68	− 15.72	27 15 47.62	+ 3 48.39	+ 29.4	1 50 34.01	− 0.18	78 26 26.6	. .
	7	η Tauri	9	40 26.69	− 0.45	**− 15.73**	15 5 44.82	+ 4 7.24	+ 15.5	3 40 10.52	+ 0.02	66 16 28.8	+ 1.4
	8	ζ Persei	9	46 40.13	− 0.28	**− 15.67**	7 17 47.85	+ 4 34.69	+ 7.3	3 46 24.13	− 0.03	58 28 51.0	+ 1.4
	9	γ^1 Eridani	9	52 34.43	− 1.10	**− 15.77**	52 39 56.88	+ 4 3.41	+ 1 14.3	3 52 17.61	+ 0.08	103 51 35.8	+ 3.9
	10	α Hydræ	9	21 50.76	− 1.03	**− 15.52**	46 55 49.72	+ 4 33.82	+ 1 1.8	9 21 34.19	− 0.04	98 7 46.5	+ 2.0
	11	Uranus	9	33 33.76	− 0.64	− 15.53	23 29 55.35	+ 4 14.89	+ 25.3	9 33 17.59	. .	74 40 56.7	. .
	12	Camilla	6	36 29.14	− 0.73	− 15.53	28 27 49.15	+ 6 48.86	+ 31.6	9 36 12.88	. .	79 41 30.8	− 1.6
	13	Anonymous	6	45 40.48	− 0.73	− 15.53	28 25 51.68	+ 6 56.89	+ 31.7	9 45 24.22	− 2.01	79 39 41.5	− 6.0
	14	γ^1 Leonis	6	13 29.67	− 0.54	**− 15.44**	18 19 56 12	+ 5 42.99	+ 19.5	10 13 13.61	− 0.06	69 32 19.8	+ 3.0
	15	γ^2 Leonis	5	13 30.04	− 0.54	− 15.52	18 19 56.12	+ 5 44.41	+ 19.5	10 13 13.98	− 2.32	69 32 21.2	− 4.7
	16	ι Cephei, s. p.	5	45 34.42	− 3.08	− 15.52	284 25 46.38	+ 4 41.49	− 3 43.2	22 45 15.82	+ 0.21	335 33 5.9	+ 3.4
	17	δ Leonis	9	7 52.52	− 0.53	**− 15.54**	17 37 51.98	+ 3 46.96	+ 18.8	11 7 36.48	− 0.02	68 48 18.9	+ 1.8
	18	ν Leonis	9	30 57.83	− 0.91	**− 15.58**	38 57 53.28	+ 3 53.80	+ 47.8	11 30 41.41	+ 0.04	90 8 56.1	+ 1.5
	19	Thyra	9	39 40.77	− 1.16	− 15.51	53 23 54.18	+ 4 49.22	+ 1 19.6	11 39 24.10	. .	104 36 24.2	− 3.9
	20	ο Virginis	.	. . .	. .	. .	150 27 54.00	+ 3 45.59	− 33.5	. . . .	. .	80 35 15.1	+ 0.5
	21	ο Virginis	.	. . .	. .	. .	29 23 54.92	+ 4 26.71	+ 33.5	. . . .	. .	80 35 16.3	+ 1.7
	22	Ate	9	13 3.46	− 1.07	− 15.50	48 11 53.52	+ 6 55.15	+ 1 6.5	12 12 46.89	. .	99 26 16.4	− 4.2
	23	β Corvi	9	28 14.82	− 1.31	**− 15.50**	61 29 58.90	+ 5 9.48	+ 1 49.2	12 27 58.01	+ 0.01	112 43 18.8	+ 3.8
	24	Cyrene	9	35 22.59	− 1.15	− 15.49	52 43 52.28	+ 6 14.73	+ 1 18.1	12 35 5.95	. .	103 57 46.3	− 4.0
	25	θ Virginis	9	3 53.91	− 1.00	**− 15.55**	43 41 47.60	+ 4 7.78	+ 56.9	13 3 37.42	+ 0.02	94 53 13.5	+ 1.9
	26	Polaris, s. p.	3	13 27.17	−41.65	− 15.49	307 30 . .	. . .	. .	1 12 30.03	− 2.53	. . . .	. .
	27	Echo	9	20 2.24	− 1.04	− 15.49	46 3 53.62	+ 4 46.20	+ 1 1.8	13 19 45.71	. .	97 16 2.8	− 4.5
	28	η Bootis	8	49 8.36	− 0.59	**− 15.43**	19 47 51.18	+ 4 52.04	+ 21.1	13 48 52.29	− 0.09	70 59 25.5	+ 2.4
	29	α Bootis	9	10 21.73	− 0.58	**− 15.46**	18 59 56.75	+ 4 18.24	+ 20.6	14 10 5.68	+ 0.01	70 10 56.8	+ 3.4
14	30	α Hydræ	9	21 50.26	− 1.17	**− 14.90**	46 55 45.55	+ 4 37.34	+ 1 2.8	9 21 34.29	+ 0.08	98 7 46.9	+ 2.4
E.	31	Camilla	1	36 46.01	− 0.86	− 14.80	28 23 47.82	+ 5 48.28	+ 31.8	9 36 30.35	. .	79 36 29.1	− 1.6
	32	ε Leonis	9	39 9.53	− 0.59	**− 14.70**	14 27 43.30	+ 5 20.19	+ 15.2	9 38 54.14	− 0.13	65 39 39.9	+ 2.3
	33	79 Draconis, s. p.	9	51 35.96	− 4.40	− 14.80	291 59 50.35	+ 3 13.25	− 2 23.9	21 51 16.76	+ 0.23	343 7 0.9	+ 3.6
	34	α Leonis	9	2 6.94	− 0.82	**− 14.81**	26 13 44 50	+ 5 28.92	+ 29.1	10 1 51.31	− 0.04	77 26 3.7	+ 2.1
	35	B. A. C. 3877 (R.)	.	. . .	. .	. .	152 13 46.52	+ 5 19 01	− 31.0	. . . .	. .	78 47 46.7	−11.1
	36	B. A. C. 3877	.	. . .	. .	. .	27 35 43.98	+ 5 11.92	+ 31.0	. . . .	. .	78 47 48.1	−11.1
	37	Thyra	5	38 13.08	− 1.31	− 14.82	53 9 53.55	+ 7 8.61	+ 1 19.4	11 37 56.95	. .	104 24 42.8	− 3.9
	38	γ Ursæ Maj. (R)	.	. . .	. .	. .	195 23 47 25	+ 4 57.87	+ 16.4	. . . .	. .	35 37 19.7	− 1.1
	39	γ Ursæ Majoris	.	. . .	. .	.	344 27 47.05	+ 3 31.14	− 16.4	. . . .	. .	35 37 23.0	+ 2.2
	40	Ate	9	11 34.64	− 1.22	− 14.83	48 1 48.65	+ 6 47.72	+ 1 6.3	12 11 18.59	. .	99 16 3.9	− 4.2
	41	η Virginis	9	13 55.09	− 1.06	**− 14.85**	38 47 46.8[illegible]	+ 4 20.86	+ 47.9	12 13 39.20	+ 0.01	89 59 16.8	+ 2.6
	42	B. A. C. 4200	9	21 51.27	− 1.13	− 14.83	42 43 47.25	+ 5 17.17	+ 55.1	12 21 35.29	− 2.36	93 56 20.7	−16.5
	43	β Corvi	9	28 14.34	− 1.48	**− 14.85**	61 29 54.38	+ 5 13.25	+ 1 49.6	12 27 58.03	+ 0.03	112 43 18.4	+ 3.2
	44	Cyrene	3	33 48.55	− 1.30	− 14.83	52 35 48.28	+ 6 21.42	− 1 18.1	12 33 32.42	. .	103 49 49.0	− 3.9
	45	θ Virginis	9	3 53.30	− 1.15	**− 14.78**	43 41 52.35	+ 4 4.47	+ 57.2	13 3 37.32	− 0.09	94 53 15.2	+ 3.6
	46	Polaris, s. p.	5	13 30.56	−42.99	− 14.83	307 29 52.70	+ 4 24.70	− 1 17.6	1 12 32.74	− 0.33	358 39 21.0	+ 2.0
	47	Echo	9	18 12.88	− 1.18	− 14.83	45 47 51.45	+ 6 35.33	+ 1 1.7	13 17 56.87	. .	97 1 49.7	− 4.5
20	48	Moon I, N.	9	23 51.31	− 0.38	− 13.16	16 25 38.95	+ 3 21.47	+ 16.7	8 23 37.77	+72.96	67 35 38.3	−26.0
S.	49	ε Hydræ	9	40 30.96	− 0.59	**− 13.16**	31 55 49.95	+ 5 11.39	+ 35.4	8 40 17.22	− 0.04	83 7 57.9	+ 3.6

Barom.	At. Ther.	Ex Ther.
in.	°	°
29.96	58.4	60.5
29.94	62.5	63.0
30.03	57.0	55.4
30.07	53.0	48.8
30.10	50.0	46.0
30.12	48.2	44.0
30.13	45.3	41.2
30.00	49.5	47.5
30.02	42.0	37.6
29.64	61.0	59.9

For summary of the elements of reduction see page 3.

22. One bisection.
3, 48. Three bisections.

ZENITH-POINT CORR.

No. 1 to 9 + 52.40
No. 10 to 29 + 52.92
No. 30 to 47 + 53.92
No. 48 to 49 + 56.11

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 2.8	+ 4.2	. .	+ 1.4
2	− 2.8	− 4.2	+ 0.0	− 7.0
4	− 4.3	+ 15 58.6	. .	+ 15 54.3
5	− 4.4	− 15 58.6	+ 0.0	− 16 3.0
6	− 3.2	. .	0.0	− 3.2
11	− 0.2	. .	. .	− 0.2
48	−16 36.7	+ 16 10.7	. .	− 0 26.0

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Apr. 20	1	κ Cancri	9	1 20.42	− 0.54	− **13.14**	27 39 55.55	+ 3 35.83	+ 29.8	9 1 6.75	+ 0.04	78 50 22.4	+ 3
S.	2	α Hydræ	9	21 48.01	− 0.79	− **13.11**	46 55 54.65	+ 4 40.01	+ 1 1.0	9 21 34.10	− 0.03	98 7 46.9	+ 2
	3	ε Leonis	9	39 7.62	− 0.36	− **13.10**	14 27 54.02	+ 5 10.23	+ 14.8	9 38 54.15	− 0.04	65 39 40.2	+ 3
	4	α Leonis	9	2 4.90	− 0.55	− **13.11**	26 13 52.55	+ 5 22.20	+ 28.3	10 1 51.25	− 0.03	77 26 4.3	+ 2
	5	γ¹ Leonis	9	13 27.13	− 0.43	− **13.10**	18 19 57.80	+ 5 42.35	+ 19.1	10 13 13.61	+ 0.03	69 32 20.5	+ 4
	6	9 Draconis	9	24 53.76	+ 2.35	− 13.08	322 29 54.85	+ 3 36.67	− 44.0	10 24 43.03	+ 0.09	13 39 8.7	+ 2
	7	226 Cephei, S. P.	9	30 18.72	− 3.64	− 13.08	294 27 51.88	+ 3 16.16	− 2 5.3	22 30 2.00	+ 0.05	345 35 23.9	+ 3
21	8	κ Cancri	8	1 20.48	− 0.61	− **13.15**	27 39 52.52	+ 3 35.85	+ 30.5	9 1 6.72	+ 0.03	78 50 20.1	+ 1
P.	9	1 Draconis	5	19 41.51	+ 4.99	− 13.14	316 57 56.00	+ 4 19.62	− 54.1	9 19 33.36	− 0.12	8 7 42.7	+ 2
	10	α Hydræ	9	21 48.08	− 0.89	− **13.10**	46 56 . .	. .	. .	9 21 34.05	− 0.06	. . . .	.
	11	Moon I, N.	9	22 39.82	− 0.53	− 13.14	21 37 52.15	+ 4 11.17	+ 23.1	9 22 26.15	+70.59	72 48 47.6	.
	12	Uranus	9	33 11.38	− 0.56	− 13.14	23 27 53.95	+ 4 59.44	+ 25.4	9 32 57.68	. .	74 39 40.0	.
	13	ε Leonis	9	39 7.70	− 0.42	− **13.14**	14 28 . .	. .	. .	9 38 54.14	− 0.03	. . . .	.
	14	α Leonis	9	2 5.00	− 0.60	− **13.17**	26 14 . .	. .	. .	10 1 51.27	0.00	. . . .	.
	15	Polaris, S. P.	5	13 23.95	−34.39	− 13.08	307 30 . .	. .	. .	1 12 36.48	+ 1.57	. . . .	.
	16	α Virginis	9	18 59.36	− 0.97	− **13.05**	49 20 . .	. .	. .	13 18 45.31	− 0.06	. . . .	.
	17	ζ Virginis	9	28 42.02	− 0.82	− **13.10**	38 46 . .	. .	. .	13 28 28.12	+ 0.01	. . . .	.
22	18	α Leonis	9	2 4.64	− 0.73	− **12.70**	26 13 47.65	+ 5 27.19	+ 28.6	10 1 51.32	+ 0.07	77 26 4.6	+ 3
E.	19	γ¹ Leonis	6	13 26.68	− 0.60	− **12.51**	18 19 53.38	+ 5 46.68	+ 19.2	10 13 13.49	− 0.06	69 32 20.5	+ 4
	20	γ² Leonis	5	13 26.98	− 0.60	− 12.59	18 19 53.38	+ 5 48.14	+ 19.2	10 13 13.79	− 2.20	69 32 21.9	.
	21	Moon, N.	.	. . .	. .	. .	27 49 51.50	+ 6 33.50	+ 30.6	. . . .	. .	79 3 16.8	.
	22	45 Leonis	9	21 24.71	− 0.80	− 12.59	28 25 47.05	+ 4 10.55	+ 31.4	10 21 11.32	− 2.06	79 36 50.2	− 7
	23	*l* Leonis	9	43 2.98	− 0.76	− **12.57**	27 37 46.35	+ 3 48.25	+ 30.4	10 42 49.62	0.00	78 48 26.2	+ 2
	24	B. A. C. 3742¹ (R.)	.	. . .	. .	. .	166 25 43.88	+ 5 6.07	− 13.9	. . . .	. .	64 35 45.1	− 4
	25	B. A. C. 3742¹	.	. . .	. .	. .	13 23 52.42	+ 5 18.63	+ 13.9	. . . .	. .	64 35 46.1	− 4
	26	λ Draconis (R.)	.	. . .	. .	. .	211 1 46.95	+ 4 37.66	+ 34.9	. . . .	. .	19 59 21.7	− 1
	27	λ Draconis	.	. . .	. .	. .	328 49 52.20	+ 3 45.83	− 34.9	. . . .	. .	19 59 24.3	+ 1
	28	β Corvi	9	28 12.02	− 1.30	− **12.71**	61 29 50.32	+ 5 20.56	+ 1 46.8	12 27 58.11	+ 0.11	112 43 18.9	+ 2
	29	Weisse 498	9	31 29.31	− 0.99	− 12.61	41 41 49.05	+ 4 47.48	+ 51.8	12 31 15.71	− 2.39	92 53 49.5	−16
	30	12¹ Canum Venat.	9	50 30.88	− 0.23	− 12.61	359 49 51.45	+ 5 14.56	− 0.1	12 50 18.04	− 3.16	51 1 27.1	−10
	31	12² Canum Venat.	9	50 32.17	− 0.23	− **12.44**	359 49 51.45	+ 5 1.33	− 0.1	12 50 19.33	− 0.14	51 1 13.9	+ 2
	32	θ Virginis	9	3 51.08	− 1.02	− **12.66**	43 41 50.18	+ 4 6.93	+ 55.6	13 3 37.45	+ 0.01	94 53 13.9	+ 2
	33	Echo	9	11 16.91	− 1.04	− 12.61	44 53 51.80	+ 6 21.50	+ 58.1	13 11 3.26	. .	96 7 32.6	− 4
	34	Polaris, S. P.	5	13 27.14	−39.89	− 12.61	307 29 52.90	+ 4 19.69	− 1 15.4	1 12 34.64	− 0.48	358 39 18.4	+ 1
	35	α Virginis	9	18 59.07	− 1.11	− **12.62**	49 19 54.72	+ 4 3.57	+ 1 7.7	13 18 45.35	− 0.02	100 31 27.2	+ 2
F.	36	γ Pegasi	9	7 7.34	− 0.57	− **12.47**	24 17 50.85	+ 5 24.59	+ 25.8	0 6 54.24	+ 0.01	75 30 2.4	+ 1
	37	Polaris	5	12 12.22	+36.46	− 12.55	310 9 57.60	+ 5 32.85	− 1 6.7	1 12 36.13	− 0.90	1 20 44.9	+ 1
	38	η Piscium	9	25 7.27	− 0.55	− **12.61**	24 5 50.28	+ 4 43.22	+ 25.4	1 24 54.17	+ 0.14	75 17 20.1	+ 4
23	39	α Tauri	9	29 5.13	− 0.52	− **12.56**	22 33 48.92	+ 3 45.88	+ 23.3	4 28 52.02	− 0.04	73 44 19.3	+ 5
	40	ι Aurigæ	9	49 12.08	− 0.21	− **12.52**	5 49 52.60	+ 5 22.77	+ 5.8	4 48 59.27	− 0.10	57 1 42.4	+ 4
	41	β Orionis	9	8 51.36	− 0.85	− **12.67**	47 7 46.15	+ 5 35.98	+ 1 0.2	5 8 37.93	+ 0.07	98 20 43.5	+ 2
	42	δ Orionis	9	25 57.13	− 0.75	− **12.62**	39 11 47.92	+ 4 35.38	+ 45.6	5 25 43.78	− 0.01	90 23 30.1	+ 2
	43	ε Orionis	9	30 12.12	− 0.76	− **12.63**	40 5 43.62	+ 4 3.74	+ 47.0	5 29 58.75	+ 0.02	91 16 55.6	+ 3
	44	ε Leonis	9	39 6.99	− 0.40	− **12.48**	14 27 42.28	+ 5 20.56	+ 14.8	9 38 54.11	− 0.03	65 39 38.8	+ 1
	45	μ Leonis	9	46 0.94	− 0.36	− **12.48**	12 13 44.32	+ 4 35.93	+ 12.4	9 45 48.10	− 0.04	63 24 53.8	+ 1
	46	79 Draconis, S. P.	9	51 33.52	− 3.75	− 12.49	291 59 51.32	+ 3 8.04	− 2 19.6	21 51 17.28	+ 0.10	343 7 1.0	+ 4
	47	γ¹ Leonis	.	. . .	. .	. .	18 19 52.35	+ 5 47.03	+ 19.0	. . . .	. .	69 32 19.6	+ 3
	48	γ² Leonis	.	. . .	. .	. .	18 19 52.35	+ 5 50.03	+ 19.0	. . . .	. .	69 32 22.6	− 3
	49	9 Draconis (R.)	.	. . .	. .	. .	217 21 46.05	+ 4 46.90	+ 43.8	. . . .	. .	13 39 4.4	− 1
	50	9 Draconis	.	. . .	. .	. .	322 29 48.70	+ 3 42.99	− 43.8	. . . .	. .	13 39 9.1	+ 2

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	. .	. .	68.0
7	29.73	54.5	52.3
8	30.06	54.3	53.2
13	30.08	52.9	51.8
18	30.28	61.5	59.0
19	30.28	61.5	59.0
35	30.28	57.0	56.0
36	30.34	63.5	67.4
43	30.20	53.0	76.0
44	30.16	65.6	64.6

For summary of the elements of reduction see page 3.

9, 21. Three bisections.
11, 37. Five bisections.
12, 46. Four bisections.
49, 50. One bisection.

ZENITH-POINT CORR.

No. 1 to 7 + 56″.11
No. 8 to 12 + 55.14
No. 18 to 35 + 54.87
No. 36 to 43 + 53.27
No. 44 to 50 + 54.24

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	−21 45.1	+ 16 12.5	. .	− 5 32.
12	− 0.2	. .	. .	− 0.
21	−27 37.6	+ 16 12.8	. .	− 11 24.

TE D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
. 23	1	α Ursæ Maj. (R.)	.	. . .	. .	. .	203 25 44.30	+ 5 10.98	+ 25.0	. . . .	. .	27 35 0.9	− 2.5
.	2	α Ursæ Majoris	5	56 23.33	+ 0.82	− 12.52	336 23 51.18	+ 5 17.64	− 25.0	10 56 11.63	− 0.05	27 35 5.0	+ 1.6
	3	δ Leonis (R.)	.	. . .	. .	. .	162 13 44.82	+ 4 36.69	− 18.4	. . . .	. .	68 48 18.1	+ 2.1
	4	δ Leonis	.	. . .	. .	. .	17 37 46.52	+ 3 50.99	+ 18.4	. . . .	. .	68 48 17.3	+ 1.3
	5	Moon I, N.	6	10 57.55	− 0.72	− 12.52	34 40 49.68	+ 5 28.17	+ 39.9	11 10 44.31	+67.28	85 53 18.9	. .
	6	B. A. C. 3934	9	28 46.71	− 1.28	− 12.53	71 1 52.10	+ 8.84	+ 2 46.2	11 28 32.90	− 1.96	122 11 8.3	−20.0
	7	B. A. C. 3948	9	31 11.09	− 1.28	− 12.53	71 1 52.10	+ 7 38.94	+ 2 47.4	11 31 57.28	− 1.98	122 18 39.6	−20.0
	8	Taylor 6304	9	40 55.34	− 1.43	− 12.54	78 33 45.30	+ 5 24.18	+ 4 39.7	11 40 41.37	− 2.02	129 50 10.4	−20.9
	9	β Leonis	9	43 2.66	− 0.57	− **12.54**	23 33 47.70	+ 4 2.85	+ 25.2	11 42 49.55	− 0.01	74 44 33.0	+ 2.8
	10	Lalande 23951	9	45 17.40	− 0.98	− 12.57	51 37 50.30	+ 3 32.10	+ 1 13.1	12 45 3.85	− 2.37	102 48 56.7	−18.3
	11	B. A. C. 4355	9	54 5.09	− 1.30	− 12.58	71 39 50.95	+ 1 36.20	+ 2 53.2	12 53 51.21	− 2.41	122 50 41.6	−19.9
	12	B. A. C. 4357¹	5	54 31.05	− 1.30	− 12.58	71 39 50.95	+ 8 52.23	+ 2 54.4	12 54 20.17	− 2.42	122 57 58.8	−19.9
	13	B. A. C. 4357²	5	54 34.75	− 1.30	− 12.58	71 39 50.95	+ 8 48.81	+ 2 54.4	12 54 20.87	− 2.42	122 57 55.4	−19.9
	14	50 Virginis	9	3 35.00	− 0.93	− 12.58	48 27 43.75	+ 5 29.23	+ 1 5.5	13 3 21.49	− 2.44	99 40 39.7	−18.2
	15	B. A. C. 4417	3	5 28.26	− 1.39	− 12.58	75 53 50.32	+ 5 22.60	+ 3 48.0	13 5 14.29	− 2.50	127 9 22.1	−19.8
	16	Echo	2	10 28.21	− 0.88	− 12.58	44 47 47.58	+ 6 3.27	+ 57.7	13 10 14.75	. .	96 1 9.7	− 4.3
	17	Polaris, S. P.	4	13 25.50	−36.74	− 12.58	307 29 46.38	+ 4 24.46	− 1 15.2	1 12 36.18	+ 0.82	358 39 16.8	+ 0.4
	18	ε Bootis	9	39 52.49	− 0.40	− 12.63	11 13 43.32	+ 4 25.02	+ 11.6	14 39 39.46	− 0.27	62 24 41.1	+ 0.7
5.	19	γ Pegasi	9	7 7.07	− 0.52	− **12.29**	24 18 . .	. . .	. .	0 6 54.23	− 0.02	. . . .	. .
	20	β Ceti	9	37 38.51	− 1.02	− **12.35**	57 28 1.08	+ 3 46.91	+ 1 27.5	0 37 25.18	+ 0.10	108 39 36.7	0.0
	21	Polaris	5	12 7.32	+40.12	− 12.30	310 10 1.80	+ 5 23.88	− 1 5.4	1 12 35.14	− 0.35	1 20 41.5	− 2.2
	22	Venus II, S.	9	58 27.28	− 0.55	− 12.29	27 51 51.78	+ 4 58.38	+ 29.3	1 58 14.44	− 0.31	79 3 40.7	. .
	23	Venus, N.	.	. . .	. .	. .	27 51 51.78	+ 4 50.58	+ 29.3	. . . .	. .	79 3 32.9	. .
24	24	Sun I, N.	9	8 25.26	− 0.51	− 12.28	25 29 51.32	+ 3 40.61	+ 26.4	2 8 12.47	. .	76 40 19.5	. .
	25	Sun II, S.	9	10 36.23	− 0.51	− 12.28	26 1 49.85	+ 3 32.87	+ 27.0	2 10 23.44	. .	77 12 10.9	. .
	26	Mercury II, C.	9	19 8.50	− 0.38	− 12.26	18 15 48.98	+ 5 7.48	+ 18.2	3 18 55.86	− 0.23	69 27 35.9	. .
	27	η Tauri	9	40 23.08	− 0.31	− **12.28**	15 5 49.20	+ 4 4.11	+ 15.0	3 40 10.52	+ 0.04	66 16 29.5	+ 1.5
	28	ε Tauri	9	21 38.94	− 0.40	− **12.22**	19 53 57.85	+ 4 54.00	+ 19.9	4 21 26.30	− 0.01	71 5 32.9	+ 3.3
	29	α Tauri	9	29 4.73	− 0.44	− **12.24**	22 33 51.38	+ 3 43.16	+ 22.8	4 48 52.05	− 0.01	73 44 18.5	+ 4.2
25	30	β Cephei, S. P.	9	27 17.39	− 3.10	− 12.28	288 53 43.78	+ 3 37.44	− 2 43.1	29 27 2.01	− 0.16	340 0 59.3	+ 3.8
P.	31	Weisse 774	8	36 52.61	− 0.80	− 12.28	40 29 54.92	+ 3 55.66	+ 48.5	9 36 39.53	− 1.63	01 41 0.3	− 8.9
	32	ε Leonis	9	39 6.78	− 0.45	− **12.24**	14 27 49.88	+ 5 12.23	+ 14.7	9 38 54.05	+ 0.07	65 39 38.0	+ 1.2
	33	μ Leonis	9	46 0.76	− 0.42	− **12.26**	12 13 52.10	+ 4 28.35	+ 12.4	9 45 48.06	+ 0.02	63 24 54.0	+ 1.7
	34	Weisse(2) 1106(?)	9	53 44.92	− 0.54	− 12.28	20 45 54.32	+ 4 34.33	+ 21.6	9 53 32.10	− 2.02	71 57 11.4	− 3.3
	35	α Leonis	9	2 4.08	− 0.62	− **12.28**	26 13 52.78	+ 5 20.59	+ 28.1	10 1 51.18	− 0.04	77 26 2.7	+ 1.7
	36	32 Ursæ Majoris	9	9 20.69	+ 0.94	− 12.28	333 5 54.48	+ 4 49.72	− 28.1	10 9 9.35	+ 0.18	24 16 37.3	+ 1.7
	37	γ¹ Leonis	9	13 26.39	− 0.51	− **12.34**	18 19 56.28	+ 5 42.33	+ 18.9	10 13 13.60	+ 0.08	69 32 18.7	+ 3.0
	38	B. A. C. 3553	9	17 33.79	− 0.83	− 12.28	41 49 55.85	+ 4 23.17	+ 51.0	10 17 20.68	− 1.82	93 1 31.2	−11.4
	39	B. A. C. 3652 (R.)	.	. . .	. .	. .	210 43 53.60	+ 5 11.91	+ 34.0	. . . .	. .	20 16 41.7	+ 8.7
	40	B. A. C. 3652	9	34 30.39	+ 1.30	− 12.28	329 5 53.20	+ 5 5.33	− 34.0	10 34 19.41	− 5.18	20 16 45.7	+ 8.7
	41	l Leonis (R.)	.	. . .	. .	. .	152 13 53.88	+ 4 33.19	− 29.9	. . . .	. .	78 48 24.0	+ 0.8
	42	l Leonis	3	43 2.65	− 0.65	− 12.38	27 37 53.00	+ 3 41.41	+ 29.9	10 42 49.72	+ 0.13	78 48 25.5	+ 2.3
	43	α Ursæ Maj. (R.)	.	. . .	. .	. .	203 25 51.92	+ 5 3.93	+ 24.8	. . . .	. .	27 35 0.5	− 2.5
	44	α Ursæ Majoris	.	. . .	. .	. .	336 23 55.32	+ 5 11.07	− 24.8	. . . .	. .	27 35 3.7	+ 0.7
	45	B. A. C. 3822	9	4 14.14	− 1.23	− 12.28	70 27 55.40	+ 5 22.99	+ 2 40.3	11 4 0.63	− 1.79	121 42 19.9	−19.8
	46	B. A. C. 3851 (R.)	.	. . .	. .	. .	173 15 49.42	+ 3 48.79	− 6.7	. . . .	. .	57 46 49.7	− 4.1
	47	B. A. C. 3851	.	. . .	. .	. .	6 35 53.28	+ 4 28.76	+ 6.7	. . . .	. .	57 46 49.9	− 4.1
	48	Anonymous.	9	26 56.14	− 0.69	− 12.28	30 25 55.28	+ 6 24.35	+ 33.8	11 26 43.17	− 2.29	81 39 14.6	−11.6
	49	γ Cephei, S. P.	9	34 29.91	− 4.30	− 12.28	295 47 55.82	+ 4 20.49	− 1 57.5	23 34 13.33	+ 0.23	346 56 40.0	+ 2.0
	50	Taylor 6304	6	40 55.07	− 1.39	− 12.28	78 33 54.98	+ 5 20.28	+ 4 37.6	11 40 41.40	− 2.00	129 50 14.1	−21.2

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.13	61.0	57.0
30.08	55.5	51.6
30.02	66.4	69.0
30.00	71.2	74.8
29.98	74.3	78.0
29.96	78.1	80.0
29.95	78.5	80.2
30.03	65.6	65.0
30.04	63.7	62.2
30.06	61.7	59.8

For summary of the elements of reduction see page 3

9, 12, 13, 17, 43, 44. One bisection.
5, 21. Three bisections.
33. Four bisections.

ZENITH-POINT CORR.

No. 1 to 18 + 54.24″
No. 20 to 29 + 53.49
No. 30 to 50 + 55.16

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
5	−33 37.1	+ 16 11.0	. .	− 17 26.0
22	− 2.4	− 3.9	+ 0.0	− 6.3
23	− 2.4	+ 3.9	. .	+ 1.5
24	− 3.8	+ 15 55.7	. .	+ 15 51.9
25	− 3.8	− 15 55.7	. .	− 15 59.5
26	− 2.6	. .	− 0.3	− 2.9

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Apr. 25	1	4 Draconis . .	9	6 43 24	+ 2.97	− 12.28	320 31 54.85	+ 4 32.73	− 47.1	12 6 33.93	− 0.36	11 42 1.7	+ 0
P.	2	B. A. C. 4165 .	5	15 3.76	+26.97	− 12.28	310 27 53.92	+ 3 57.93	− 1 7.1	12 15 18.45	−57.98	1 37 5.9	+ 1
	3	B. A. C. 4200 .	9	21 48.59	− 0.85	− 12.28	42 43 57.18	+ 5 10.23	+ 53.2	12 21 35.46	− 2.35	93 56 21.8	−16
	4	κ Draconis . .	9	28 30.51	+ 1.38	− 12.28	328 21 51.90	+ 4 23.99	− 35.3	12 28 19.61	+ 0.10	19 32 4.8	+ 0
	5	21 Cassiopeæ, S. P. .	9	37 44.87	− 3.68	− 12.29	293 9 53.32	+ 4 54.30	− 2 13.0	0 37 28.90	+ 0.28	344 18 55.8	+ 3
	6	32¹ Camelopardalis	5	48 29.10	+ 6.76	− 12.29	314 45 53.65	+ 3 35.31	− 57.9	12 48 23.57	. .	5 54 52.3	− 2
	7	32² Camelopardalis	5	48 36.76	+ 6.76	− 12.29	314 45 53.65	+ 3 53.71	− 57.9	12 48 31.23	− 0.11	5 55 10.8	+ 0
	8	12² Canum Venat. .	9	30 31.96	− 0.19	− 12.28	359 50 . .	. . .	. .	12 50 19.48	+ 0.02	. . . .	.
	9	Moon I, N. . .	9	54 25.24	− 0.93	− 12.29	48 31 55.90	+ 4 9.47	+ 1 5.3	12 54 12.02	+67.26	99 43 31.9	.
	10	Ianthe . . .	9	4 33.92	− 1.12	− 12.29	62 17 54.15	+ 5 16.24	+ 1 49.8	13 4 20.51	. .	113 31 21.4	− 5
	11	Polaris, S. P. .	5	13 19.96	−34.40	− 12.29	307 29 54.92	+ 4 16.41	− 1 14.9	1 12 33.27	− 2.73	358 39 17.6	+ 1
	12	50 Cassiopeæ, S. P. .	9	53 10.17	− 3.24	− 12.29	290 41 54.32	+ 3 52.32	− 2 31.3	1 52 54.64	+ 0.31	341 49 36.5	+ 2
	13	B. A. C. 4686 .	9	59 43.24	− 1.32	− 12.29	74 31 56.15	+ 4 25.00	+ 3 26.8	13 59 29.63	− 2.71	125 46 9.2	−18
	14	Lalande 26003 . .	8	5 27.13	− 0.96	− 12.29	50 49 55.98	+ 4 22.04	+ 1 11.1	4 5 13.88	− 2.56	102 1 50.3	−18
	15	B. A. C. 4737 .	9	11 51.23	− 0.60	− 12.29	22 57 56.55	+ 5 36.28	+ 24.6	14 11 38 34	− 2.68	74 10 18.4	−17
	16	B. A. C. 4778 .	9	18 38.61	− 0.23	− 12.29	1 3 53.82	+ 4 8.60	+ 1.1	14 18 26.09	− 3.05	52 14 24.7	−16
	17	Anonymous .	9	31 2.68	− 1.09	− 12.29	60 17 52.48	+ 4 44.92	+ 1 41.5	14 30 49.30	− 2.64	111 30 40.1	−18
	18	B. A. C. 4903 .	9	45 11.27	0.00	− 12.29	352 11 53.95	+ 4 24.84	− 7.9	14 44 58.98	− 3.24	43 22 32.1	−17
	19	β Ursæ Minoris .	9	51 21.41	+ 2.03	− 12.29	324 9 56.20	+ 5 11.10	− 41.8	14 51 11.15	− 0.07	15 20 46.7	− 0
	20	B. A. C. 4967 .	9	58 50.09	+ 0.56	− 12.29	338 7 55.25	+ 5 6.88	− 23.2	14 58 38.36	− 3.94	29 19 0.1	−17
	21	γ² Ursæ Min. (R.) .	.	. . .	. .	. .	213 17 50.42	+ 3 52.02	+ 38.3	. . . .	. .	17 44 0.5	+ 1
	22	γ² Ursæ Minoris .	8	21 12.26	+ 1.62	− 12.29	326 33 57.38	+ 4 20.34	− 38.3	15 21 1.59	+ 0.16	17 44 0.6	− 0.
	23	α Cor. Bor. (R.) .	.	. . .	. .	. .	168 9 51.15	+ 4 8.52	− 12.1	. . . .	. .	62 52 33.8	+ 1.
	24	α Cor. Borealis .	.	. . .	. .	. .	11 41 53.98	+ 4 6.35	+ 12.1	. . . .	. .	62 52 33.6	+ 1.
	25	α Serpentis (R.) .	.	. . .	. .	. .	147 51 53.62	+ 3 34.21	− 36.5	. . . .	. .	83 11 29.9	+ 1.
	26	α Serpentis . .	.	. . .	. .	. .	31 59 55.78	+ 4 36.46	+ 36.5	. . . .	. .	83 11 29.9	+ 1.
	27	ζ Ursæ Min. (R.) .	.	. . .	. .	. .	219 11 53.20	+ 3 40.38	+ 47.6	. . . .	. .	11 50 0.0	− 0.
	28	ζ Ursæ Minoris .	4	48 45.28	+ 2.90	− 12.29	320 39 54.82	+ 4 33.42	− 47.6	15 48 35.89	+ 0.03	11 50 1.8	+ 1.
	29	δ Ophiuchi . .	9	8 9.68	− 0.85	− **12 29**	42 9 55.55	+ 5 41.92	+ 52.9	16 7 56.54	+ 0.02	93 22 51.6	+ 1.
	30	B. A. C. 5451 .	9	15 13.68	− 1.37	− 12.29	75 53 55.40	+ 3 57.20	+ 3 49.1	16 15 0.02	− 2.95	127 8 2.9	−11.
	31	α Scorpii . . .	9	22 8.23	− 1.17	− **12.27**	64 55 58.22	+ 5 15.91	+ 2 4.6	16 21 54.77	− 0.04	116 9 39.9	+ 1.
	32	β Herculis. . .	9	25 11.12	− 0.50	− 12.29	17 3 55.10	+ 4 15.55	+ 18.0	16 24 58.33	− 2.42	68 14 49.9	−20.
	33	ζ Ophiuchi . .	9	30 38.98	− 0.94	− **12.32**	49 7 58.25	+ 3 47.70	+ 1 7.5	16 30 25.75	+ 0.03	100 19 14.7	+ 1.
	34	η Herculis . .	9	38 55.78	− 0.19	− **12.37**	359 39 57.30	+ 4 39.19	− 0.3	16 38 43.30	+ 0.08	50 50 57.4	+ 2.
	35	O. Arg. S. 15973.	9	41 37.67	− 1.16	− 12.29	64 7 55.90	+ 1 13.27	+ 1 59.9	16 41 24.22	− 2.67	115 17 30.3	−12.
	36	O. Arg. S. 15981.	9	42 3.45	− 1.16	− 12.29	64 7 55.90	+ 4 17.87	+ 2 0.1	16 41 50.00	− 2.67	115 20 35.1	−12.
	37	κ Ophiuchi . .	9	52 6.02	− 0.68	− **12.22**	29 13 56.42	+ 5 25.69	+ 32.8	16 51 53.05	0.00	80 26 16.1	+ 2.
	38	ε Ursæ Minoris .	9	58 51.30	+ 4.89	− 12.29	316 35 55.05	+ 4 50.51	− 55.0	16 58 43.90	− 0.39	7 46 11.8	+ 1.
May 1	39	Ianthe . . .	9	59 1.33	− 1.64	− 11.27	62 8 0.45	+ 5 50.05	+ 1 51.9	12 58 48.42	. .	113 22 3.6	− 5.
F.	40	Polaris, S. P. . .	5	13 39.88	−49.89	− 11.29	307 29 58.28	+ 4 12.16	− 1 16.8	1 12 38.70	− 0.24	358 39 14.8	− 0.
	41	B. A. C. 4509 .	.	. . .	. .	. .	19 7 59.92	+ 3 53.84	+ 20.6	. . . .	. .	70 18 35.6	−14.
	42	Dione . . .	4	28 22.24	− 1.24	− 11.30	44 6 1.82	+ 4 51.76	+ 57.5	13 28 9.70	. .	95 18 12.3	− 2.
	43	η Bootis . . .	9	49 4.51	− 0.74	− **11.32**	19 47 58.10	+ 4 41.65	+ 21.4	13 48 52.45	− 0.04	70 59 22.4	+ 1.
	44	B. A. C. 4674 .	9	56 9.43	− 1.83	− 11.33	69 52 1.02	+ 4 48.84	+ 2 40.9	13 55 56.27	− 2.69	121 5 52.0	−19.
	45	α Bootis . . .	9	10 17.90	− 0.72	− **11.34**	18 59 58.52	+ 4 12.32	+ 20.5	14 10 5.84	+ 0.02	70 10 52.5	+ 1.
	46	B. A. C. 4759 .	9	15 44.16	− 2.08	− 11.35	77 42 0.18	+ 4 25.93	+ 4 27.1	14 15 30.73	− 2.88	128 57 14.4	−19.
	47	B. A. C. 5017 .	9	8 15.48	− 2.14	− 11.40	79 46 6.75	+ 4 26.39	+ 5 19.5	15 8 1.94	− 3.11	131 2 13.8	−16.
	48	μ¹ Bootis . . .	9	20 5.20	− 0.24	− **11.38**	0 59 55.75	+ 5 26.25	+ 1.1	15 19 53.55	− 0.07	52 11 44.3	+ 0.
	49	α Cor. Borealis .	9	29 43.58	− 0.54	− **11.45**	11 41 58.98	+ 3 57.74	+ 12.3	15 29 31.62	+ 0.04	62 52 30.2	− 0.
	50	12² Canum Venat. .	8	50 30.73	− 0.05	− **11.23**	359 50 16.55	+ 4 32.24	− 0.1	12 50 19.43	+ 0.01	51 1 9.9	+ 0.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	30.06	59.4	57.7
11	30.06	57.5	55.6
15	30.07	57.0	54.6
28	30.08	53.4	51.2
38	30.08	53.2	50.5
39	29.87	43.8	40.6
44	29.86	43.0	39.8
45	29.86	43.0	39.8
49	29.84	43.0	39.8
50	29.93	46.1	44.1

For summary of the elements of reduction see page 3.

10, 36, 39. One bisection.
2. Three bisections.
15, 18, 32, 34, 38. Four bisections.
9, 11, 40. Five bisections.

ZENITH-POINT CORR.

No. 1 to 38 + 55″.16
No. 39 to 49 + 54.14
No. 50 + 53.75

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
9	−43 49.9	+ 16 0.9	. .	− 27 49.0

TE ID R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
y 2	1	Ianthe	9	58 11.24	− 1.59	− 11.25	62 6 7.40	+ 5 47.29	+ 1 51.2	12 57 58.40	. .	113 20 7.1	− 5.4
5.	2	Polaris, s. P.	4	13 45.12	−54.36	− 11.24	307 30 . .	. .	. .	1 12 39.52	+ 0.12	. . . .	. .
	3	Polyhymnia	3	20 17.69	− 1.26	− 11.24	47 58 1.32	+ 6 8.28	+ 1 5.5	13 18 5.19	. .	99 11 36.3	− 2.8
	4	Dione	4	27 43.84	− 1.17	− 11.24	44 2 1.25	+ 6 4.69	+ 57.1	13 27 31.43	. .	95 15 24.2	− 2.2
	5	η Ursæ Majoris	9	42 55.84	+ 0.41	− 11.23	348 54 0.55	+ 4 21.53	− 11.5	13 42 45.02	− 0.15	40 4 31.8	+ 1.1
	6	η Bootis	9	49 4.23	− 0.64	**− 11.14**	19 47 58.40	+ 4 40.74	+ 21.3	13 48 52.36	− 0.13	70 59 21.6	+ 1.2
	7	B. A. C. 4672 (R.)	.	. . .	. .	. .	143 11 59.18	+ 3 15.04	− 44.0	. . . .	. .	87 51 51.0	−17.6
	8	B. A. C. 4672	.	. . .	. .	. .	36 40 9.20	+ 3 37.62	+ 44.0	. . . .	. .	87 51 52.0	−17.6
	9	α Bootis	9	10 17.72	− 0.62	**− 11.26**	19 0 0.35	+ 4 11.15	+ 20.4	14 10 5.88	+ 0.06	70 10 53.1	+ 2.6
	10	α² Libræ	9	44 19.97	− 1.41	**− 11.32**	54 20 1.98	+ 4 21.13	+ 1 22.3	14 44 7.35	+ 0.11	105 32 6.6	+ 3.3
	11	α Cor. Borealis	9	29 43.16	− 0.42	**− 11.14**	11 42 0.50	+ 3 58.31	+ 12.3	15 29 31.55	− 0.04	62 52 32.3	+ 1.8
	12	α Serpentis	9	38 27.42	− 0.91	**− 11.25**	31 59 59.25	+ 4 32.29	+ 37.0	15 38 15.32	+ 0.09	83 11 29.7	+ 2.3
	13	ε Serpentis	9	44 55.94	− 0.95	**− 11.21**	33 57 57.02	+ 4 23.39	+ 39.9	15 44 43.80	+ 0.01	85 9 21.5	+ 1.4
	14	Hebe.	9	19 13.54	− 1.03	− 11.17	37 25 57.12	+ 6 0.19	+ 45.4	16 19 1.34	. .	88 39 3.9	− 2.9
	15	Moon II, N.	9	32 53.09	− 1.68	− 11.33	64 58 0.62	+ 3 37.39	+ 2 6.8	19 32 40.08	−68.56	116 10 6.0	. .
	16	γ Aquilæ	9	40 38.59	− 0.84	**− 11.33**	28 30 1.80	+ 4 24.42	+ 32.3	19 40 26.42	+ 0.03	79 41 19.7	+ 0.8
	17	α Aquilæ	9	45 0.82	− 0.87	**− 11.33**	30 16 . .	. .	. .	19 41 48.62	+ 0.04	. . . .	. .
3	18	Moon II, N.	5	25 0.48	− 1.59	− 11.67	61 44 3.55	+ 3 47.68	+ 1 49.8	20 24 47.22	−66.43	112 56 2.2	. .
?.	19	ε Delphini	9	27 34.13	− 0.83	**− 11.65**	27 55 58.90	+ 4 9.55	+ 31.3	20 27 21.63	+ 0.04	79 7 0.9	+ 1.7
	20	α Cygni	9	37 26.63	+ 0.16	**− 11.64**	353 57 58.15	+ 5 37.59	− 6.1	20 37 15.12	+ 0.01	45 9 50.8	+ 1.6
	21	γ¹ Delphini, N.	6	41 9.97	− 0.73	− 11.66	23 7 57.75	+ 4 32.59	+ 25.2	20 40 57.58	− 1.29	74 19 16.7	−11.6
	22	γ² Delphini, S.	5	41 10.72	− 0.73	− 11.66	23 7 57.75	+ 4 33.21	+ 25.2	20 40 58.33	− 1.29	74 19 17.4	−11.6
	23	μ Aquarii	3	46 15.74	− 1.28	**− 11.71**	48 14 2.50	+ 5 10.12	+ 1 5.9	20 46 2.80	+ 0.12	99 26 39.7	+ 1.2
	24	ν Cygni	9	52 47.72	0.00	**− 11.67**	358 7 58.32	+ 4 20.70	− 1.8	20 52 36.06	+ 0.05	49 18 38.4	+ 2.4
	25	61¹ Cygni	6	1 35.72	− 0.11	**− 11.63**	0 39 56.18	+ 5 14.00	+ 0.8	21 1 23.96	− 0.03	51 51 32.2	+ 1.3
	26	61² Cygni	5	1 37.24	− 0.11	− 11.65	0 39 56.18	+ 5 23.19	+ 0.8	21 1 25.48	− 0.76	51 51 41.4	−16.3
	27	ζ Cygni (R.)	.	. . .	. .	. .	170 45 53.92	+ 3 46.02	− 9.5	. . . .	. .	60 16 50.8	+ 0.9
	28	ζ Cygni	.	. . .	. .	. .	9 5 56.95	+ 4 23.98	+ 9.5	. . . .	. .	60 16 51.6	+ 1.7
	29	α Cephei (R.)	.	. . .	. .	. .	203 5 54.15	+ 3 37.92	+ 25.1	. . . .	. .	27 56 24.0	− 3.1
	30	α Cephei	3	15 48.73	+ 1.23	− 11.64	336 45 57.38	+ 4 33.15	− 25.1	21 15 38.32	+ 0.02	27 56 26.6	− 0.5
	31	ι Draconis, s. P.	4	19 52.63	− 9.75	− 11.64	300 44 . .	. .	. .	9 19 31.24	− 0.55	. . . .	. .
	32	β Aquarii	9	25 19.20	− 1.21	**− 11.65**	44 53 59.50	+ 5 24.20	+ 58.5	21 25 6.35	+ 0.02	96 6 43.4	+ 1.9
	33	β Cephei	5	27 12.27	+ 2.32	− 11.64	358 47 58.08	+ 5 20.35	− 35.3	21 27 2.95	+ 0.20	19 59 4.3	− 0.2
E.	34	α Andromedæ	2	2 14.00	− 0.36	**− 11.65**	10 23 51.95	+ 4 59.57	+ 10.7	0 2 1.96	0.00	61 35 23.4	+ 2.0
	35	γ Pegasi	9	7 6.89	− 0.68	**− 11.72**	24 17 53.48	+ 5 21.36	+ 26.1	0 6 54.52	+ 0.04	75 30 2.1	+ 1.8
	36	α Cassiopeæ, (R.)	.	. . .	. .	. .	196 53 55.80	+ 3 49.81	+ 17.5	. . . .	. .	34 8 18.1	− 0.4
	37	α Cassiopeæ	6	33 42.03	+ 0.72	− 11.69	342 57 57.90	+ 4 17.86	− 17.5	0 33 31.06	− 0.03	34 8 19.5	+ 1.0
	38	β Ceti	4	37 38.41	− 1.36	**− 11.72**	57 27 58.28	+ 3 45.35	+ 1 30.0	0 37 25.36	+ 0.09	108 39 34.8	+ 0.4
	39	β Andromedæ	9	3 2.49	− 0.16	− 11.70	3 51 52.68	+ 3 38.58	+ 3.9	1 2 50.63	+ 0.26	55 1 56.4	+ 0.4
	40	Polaris	7	12 1.84	+49.54	− 11.70	310 9 54.00	+ 5 38.22	− 1 7.5	1 12 39.68	− 0.36	1 20 46.8	+ 0.5
4	41	Sun I, S.	9	46 25.57	− 0.62	− 11.72	22 55 56.12	+ 4 50.48	+ 24.1	2 46 13.23	. .	74 7 31.9	. .
	42	Sun II, N.	9	48 38.14	− 0.62	− 11.72	22 23 53.25	+ 5 8.36	+ 23.5	2 48 25.80	. .	73 35 46.3	. .
	43	Mercury I, S.	9	11 18.73	− 0.45	− 11.73	15 3 53.98	+ 5 13.28	+ 15.3	4 11 6.55	+ 0.29	66 15 43.8	− 6.9
	44	α Tauri (R.)	.	. . .	. .	. .	157 17 52.72	+ 4 35.63	− 23.5	. . . .	. .	73 44 16.3	+ 2.0
	45	α Tauri	.	. . .	. .	. .	22 33 56.05	+ 3 36.49	+ 23.5	. . . .	. .	73 44 17.2	+ 2.9
	46	α Aurigæ (R.)	.	. . .	. .	. .	186 53 51.38	+ 4 50.65	+ 6.9	. . . .	. .	44 7 32.3	− 0.5
	47	α Aurigæ	.	. . .	. .	. .	352 57 55.00	+ 3 25.94	− 6.9	. . . .	. .	44 7 35.2	+ 2.4
	48	δ Orionis	9	25 56.43	− 0.96	**− 11.78**	39 11 54.02	+ 4 27.61	+ 45.9	5 25 43.72	0.00	90 23 28.7	+ 1.8
	49	ε Orionis	9	30 11.41	− 0.97	**− 11.79**	40 5 54.52	+ 3 51.26	+ 47.1	5 29 58.69	+ 0.04	91 16 54.4	+ 2.5
	50	α Orionis	9	48 43.72	− 0.80	**− 11.71**	31 25 55.40	+ 4 10.82	+ 34.4	5 48 31.17	− 0.06	82 37 1.8	+ 3.6

* *For summary of the elements of reduction see page* 3.

Barom.	At Ther.	Ex. Ther.
in.	°	°
29.93	45.4	43.2
29.93	44.0	42.0
29.95	40.2	40.1
29.82	45.2	42.1
29.82	45.4	44.7
29.87	52.5	53.0
29.84	59.2	60.9
29.84	64.0	64.0

15, 18. Three bisections.
24, 43 Four bisections.

ZENITH-POINT CORR.

No. 1 to 16 + 53.75″
No. 18 to 33 + 53.44
No. 34 to 50 + 52.44

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
15	−49 20.7	+ 14 54.0	. .	− 34 26.6
18	−47 44.6	+ 14 50.0	. .	− 32 54.6
41	− 3.4	− 15 52.8	. .	− 15 56.2
42	− 3.3	+ 15 52.8	. .	+ 15 49.5
43	− 2.8	− 4.1	. .	− 6.9

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	
May 6	1	α Cygni	9	37 26.30	+ 0.07	**− 11.10**	353 57 53.30	+ 5 42.25	− 6.2	20 37 15.24	+ 0.01	45 9 50.6	+ 1
S.	2	ζ Cygni	8	7 54.59	− 0.38	**− 11.11**	9 5 53.55	+ 4 26.34	+ 9.6	21 7 43.08	+ 0.01	60 16 50.7	+ 1
	3	β Aquarii	9	25 18.76	− 1.14	**− 11.19**	44 53 57.52	+ 5 25.56	+ 59.0	21 25 6.50	+ 0.08	96 6 43.3	+ 2
	4	ε Pegasi	9	38 21.81	− 0.84	**− 11.10**	29 29 55.22	+ 4 35.48	+ 33.5	21 38 9.85	− 0.02	80 41 25.4	+ 3
	5	α Aquarii	9	59 41.29	− 1.03	− 11.12	39 43 56.75	+ 3 55.96	+ 49.0	21 59 29.14	+ 0.02	90 55 2.9	+ 2
	6	ζ Pegasi	9	35 32.46	− 0.80	− 11.12	28 37 57.70	+ 3 50.28	+ 32.0	22 35 20.54	+ 0.12	79 48 41.2	+ 2
	7	Moon II, N.	9	45 27.20	− 1.17	− 11.12	47 6 0.35	+ 4 48.57	+ 1 3.0	22 45 14.91	−62.13	98 18 13.1	.
	8	α Piscis Aust.	9	51 5.17	− 1.66	**− 11.24**	69 3 56.12	+ 3 25.38	+ 2 32.0	22 50 52.39	+ 0.13	120 16 14.7	+ 0
	9	α Pegasi	9	58 50.51	− 0.71	**− 11.07**	24 15 53.30	+ 4 45.77	+ 26.4	22 58 38.68	− 0.03	75 27 26.7	+ 2
	10	α Andromedæ	9	2 13.47	− 0.38	**− 11.03**	10 23 55.80	+ 4 56.03	+ 10.7	0 2 1.98	− 0.05	61 35 23.7	+ 2
	11	γ Pegasi	5	7 6.36	− 0.69	**− 11.11**	24 17 52.45	+ 5 23.34	+ 26.2	0 6 54.56	+ 0.01	75 30 3.2	+ 3
P.	12	β Ceti	9	37 38.16	− 1.28	**− 11.49**	57 27 56.65	+ 3 44.26	+ 1 30.4	0 37 25.38	+ 0.05	108 39 32.5	− 1
	13	B. A. C. 253 (R.)	.	. . .	. .	. .	201 3 51.48	+ 5 6.70	+ 22.3	. . . .	. .	29 57 0.7	− 2.
	14	B. A. C. 253	.	. . .	. .	. .	338 45 56.18	+ 5 6.82	− 22.3	. . . .	. .	29 57 1.9	− 2.
	15	β Andromedæ	8	3 2.36	− 0.17	− 11.50	3 51 56.80	+ 3 33.16	+ 3.9	1 2 50.69	+ 0.19	55 1 55.1	+ 0.
S.	16	Polaris	5	12 2.92	+49.07	− 11.50	310 9 55.90	+ 5 38.59	− 1 7.6	. . . .	. .	1 20 48.1	+ 1.
P.	17	Polaris	5	12 6.28	+46.12	− 11.50	310 9 55.58	+ 5 38.09	− 1 7.6	1 12 40.90	− 0.37	1 20 47.3	+ 0.
	18	β Arietis	8	48 2.94	− 0.52	**− 11.53**	18 36 . .	. . .	. .	1 47 50.91	+ 0.04	. . . .	.
.	19	α Arietis	9	0 26.47	− 0.46	**− 11.50**	15 56 . .	. . .	. .	2 0 14.49	− 0.02	. . . .	.
7	20	Sun I, N.	9	58 0.52	− 0.57	− 11.54	21 33 57.42	+ 4 38.79	+ 22.5	2 57 48.41	. .	72 45 19.9	.
	21	Sun II, S.	9	0 13.39	− 0.57	− 11.54	22 5 57.65	+ 4 19.97	+ 23.1	3 0 1.28	. .	73 17 1.9	.
	22	α Persei (R.)	.	. . .	. .	. .	190 27 54.50	+ 3 44.17	+ 10.5	. . . .	. .	40 34 32.0	− 2.
	23	α Persei	2	15 43.62	+ 0.37	**− 11.55**	349 23 54 55	+ 4 30.19	− 10.5	3 15 32 44	+ 0.08	40 34 35.4	+ 1.
9	24	β Ceti	9	37 37.94	− 1.39	**− 11.09**	57 28 . .	. . .	. .	. . . .	. .	. . . .	.
S.	25	Moon II.	9	1 46.63	− 0.82	− 11.09	29 20 . .	. . .	. .	1 1 34.72	−64.00	. . . .	.
	26	Polaris	5	12 4.42	+49.18	− 11.09	310 9 55.48	+ 5 40.02	− 1 7.9	1 12 42.51	− 0.36	1 20 48.8	+ 0.
10	27	Sun I, N.	9	9 40.41	− 0.62	− 11.09	20 45 50.08	+ 4 52.30	+ 21.8	3 9 28.70	. .	71 57 25.4	.
	28	Sun II, S.	9	11 53.88	− 0.62	− 11.09	21 17 48.72	+ 4 34.88	+ 22.4	3 11 42.17	. .	72 29 7.2	.
P.	29	α Cassiopeæ (R.)	.	. . .	. .	. .	196 53 51.50	+ 3 53.34	+ 17.8	. . . .	. .	34 8 18.6	− 0.
	30	α Cassiopeæ	.	. . .	. .	. .	342 57 54.32	+ 4 22.99	− 17.8	. . . .	. .	34 8 20.7	+ 1.
	31	β Ceti	9	37 38.02	− 1.40	**− 11.13**	57 27 57.20	+ 3 43.36	+ 1 31.3	0 37 25.55	+ 0.12	108 39 33.1	+ 0.
	32	B. A C. 253 (R.)	.	. . .	. .	. .	201 3 52.55	+ 5 4.86	+ 22.0	. . . .	. .	29 57 1.8	− 2.
	33	B. A. C. 253	8	49 26.62	+ 1.09	− 11.07	338 45 55.38	+ 5 9.43	− 22.0	0 49 16.64	+ 1.26	29 57 4.0	− 2.
	34	Polaris	2	12 3.50	+51.26	− 11.07	310 10 . .	. . .	. .	1 12 43.69	+ 0.16	. . . .	.
	35	β Arietis	9	48 2.60	− 0.57	**− 11.06**	18 35 53.25	+ 5 0.52	+ 19.5	1 47 50.96	+ 0.01	69 47 34.5	+ 1.
	36	α Arietis	9	0 26.12	− 0.49	**− 11.03**	15 55 55.42	+ 4 36.38	+ 16.6	2 0 14.56	− 0.03	67 7 9.6	+ 2.
11	37	Sun I, S.	5	13 35.20	− 0.61	− 11.05	21 1 53.72	+ 5 6.08	+ 22.2	3 13 23.54	. .	72 13 43.2	.
	38	δ Ursæ Min, S. P.	5	12 41.22	−21.87	− 11.00	305 28 . .	. . .	. .	18 12 8.35	+ 0.15	. . . .	.
12	39	τ Leonis	9	21 50.33	− 1.02	**− 10 55**	35 15 52.12	+ 5 18.16	+ 41.4	11 21 38.72	− 0.07	86 28 12.9	+ 2.
E.	40	υ Leonis	9	30 52.87	− 1.10	**− 10.61**	38 57 51.88	+ 3 55.08	+ 47.3	11 30 41.18	− 0.01	90 8 55.5	+ 1.
	41	β Leonis	9	43 0.79	− 0.77	**− 10.61**	23 33 50.52	+ 3 58.85	+ 25.6	11 42 49.43	+ 0.01	74 44 36.2	+ 2.
	42	γ Ursæ Maj. (R)	.	. . .	. .	. .	195 23 43.60	+ 5 6.42	+ 16.2	. . . .	. .	35 37 15.0	− 0.
	43	γ Ursæ Majoris	3	47 34.78	+ 0.57	− 10.59	344 27 51.95	+ 3 19.44	− 16.2	11 47 24.76	+ 0.05	35 37 16.4	+ 1.
	44	Polaris, S. P.	5	13 46.78	−51.94	− 10.58	307 29 56.75	+ 4 11.86	− 1 16.2	1 12 44.26	− 0.33	358 39 13.6	+ 2.
	45	B. A. C. 4509	9	24 18.26	− 0.68	− 10.58	19 7 49.18	+ 4 3.96	+ 20.5	13 24 7.00	− 2.72	70 18 34.8	−12.
	46	B. A. C. 4545	8	30 13.50	+ 0.07	− 10.58	353 59 49.35	+ 4 30.44	− 6.1	13 30 2.99	− 3.30	45 10 34.9	− 8.
	47	α Bootis, (R.)	.	. . .	. .	. .	160 51 47.58	+ 4 4.47	− 20.4	. . . .	. .	70 10 49.6	+ 0.
	48	α Bootis	.	. . .	. .	. .	18 59 50.38	+ 4 20.15	+ 20.4	. . . .	. .	70 10 52.1	+ 3.
	49	ε Bootis	9	39 50.92	− 0.50	**− 10.56**	11 13 51.40	+ 4 14.93	+ 11.8	14 39 39.85	0.00	62 24 39.3	+ 2.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	29.94	43.2	39.4
9	29.95	49.2	50.0
12	29.94	53.8	54.3
16	29.94	56.6	57.1
21	29.90	61.0	62.5
23	29.89	61.7	63.9
26	29.98	55.0	55.6
28	29.99	57.7	59.2
29	30.24	52.6	54.0
35	30.25	57.2	58.1
37	30.25	60.0	60.8
39	30.33	56.5	54.5

For summary of the elements of reduction see page 3.

22, 23. One bisection.
7, 16, 26, 44. Three bisections.

ZENITH-POINT CORR.

No. 1 to 11 + 53.91"
No. 12 to 23 + 52.34
No. 26 to 28 + 52.99
No. 29 to 37 + 53.36
No. 39 to 50 + 53.87

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
7	−39 56.3	+ 14 55.7	. .	− 25 0.
20	− 3.2	+ 15 51.0	. .	+ 15 47.
21	− 3.3	− 15 51.0	. .	− 15 54.
27	− 3.1	+ 15 50.9	. .	+ 15 47.
28	− 3.2	− 15 50.9	. .	− 15 54.
37	− 3.1	− 15 53.6	. .	− 15 56.

IE D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
r 12	1	α² Libræ . . .	9	44 19.36	− 1.43	− **10.60**	54 19 52.32	+ 4 30.21	+ 1 22.3	14 44 7.36	+ 0.03	105 32 6.0	+ 2.4
E.	2	Comet *b*,1877,s.p.	9	47 42.22	− 7.71	− 10.57	298 35 46.98	+ 5 27 39	− 1 47.5	14 47 23.94	. .	349 45 48.1	. .
	3	β Bootis . . .	9	57 32.59	− 0.12	− **10.54**	357 55 50 20	+ 5 30.25	− 2.0	14 57 21.90	0.00	49 7 39.6	+ 1.5
14	4	δ Leonis . . .	9	7 46.58	− 0.51	− **9.92**	17 37 49.60	+ 3 47.12	+ 18.3	11 7 36.11	− 0.09	68 48 16.2	+ 2.1
i.	5	δ Crateris . . .	6	13 24.48	− 1.16	− **9.96**	52 55 54.40	+ 3 33.54	+ 1 15.9	11 13 13.36	0.00	104 7 5.0	+ 1.6
	6	β Leonis . . .	9	43 0.02	− 0.63	− **10.00**	23 33 55.18	+ 3 55.11	+ 25.1	11 42 49.43	+ 0.03	74 44 36.6	+ 3.2
	7	B. A. C. 4092 .	9	2 46.93	− 1.74	− 9.97	79 17 54.62	+ 4 0.73	+ 4 56.3	12 2 35.22	− 1.98	130 33 12.9	−24.0
	8	B. A. C. 4123 (R) .	.	. . .	. .	. .	198 43 49.50	+ 5 13.12	+ 19.6	. . . .	. .	32 16 59.0	+ 1.2
	9	B. A. C. 4123 .	.	. . .	. .	. .	341 5 57.12	+ 5 4.19	− 19.6	. . . .	. .	32 17 2.9	+ 1.2
	10	B. A. C. 4195 (R.) .	.	. . .	. .	. .	169 59 55.52	+ 3 37 03	− 10.1	. . . .	. .	61 2 58.7	− 6.9
	11	B. A. C. 4195 . .	.	. . .	. .	. .	9 51 54.22	+ 4 34.80	+ 10.1	. . . .	. .	61 3 0.3	− 6.9
	12	12¹ Canum Venat. .	5	50 28.17	− 0.07	− 9.97	359 49 55.88	+ 5 5.52	− 0.1	12 50 18.13	− 3.02	51 1 22.5	− 6.2
	13	12² Canum Venat. .	6	50 29.48	− 0.07	− 9.97	359 49 55.88	+ 4 51.58	− 0.1	12 50 19.44	+ 0.11	51 1 8.6	+ 1.8
	14	B. A. C. 4355 .	6	54 2.84	− 1.54	− 9.97	71 39 57.22	+ 1 33.12	+ 2 52.1	12 53 51.33	− 2.38	122 50 43.6	−22.6
	15	B. A. C. 4357¹ .	6	54 31.92	− 1.54	− 9.97	71 39 57.22	+ 8 51.32	+ 2 53.3	12 54 20.41	− 2.38	122 58 3.0	−22.6
	16	B. A. C. 4357² .	5	54 32.39	− 1.54	− 9.97	71 39 57.22	+ 8 46.92	+ 2 53.3	12 54 20.85	− 2.38	122 57 58.6	−22.6
	17	Polaris, s. p. . .	5	13 42.48	−46.74	− 9.98	307 29 56.50	+ 4 9 72	− 1 14.7	1 12 45 76	− 0.26	358 39 12.7	+ 1.6
	18	Durch. 7°, 2641 .	9	18 46 40	− 0.79	− 9.98	31 27 52.38	+ 4 55.63	+ 35.4	13 18 35.63	− 2.58	82 39 44.6	−15.0
	19	Pales. . . .	5	24 25.82	− 1.25	− 9.99	57 13 53.28	+ 6 0.91	+ 1 29.8	14 24 14.58	. .	108 27 45.2	− 2.7
	20	β Bootis . . .	9	57 31.96	− 0.03	− **9.99**	357 55 52.95	+ 5 25.20	− 2.0	14 57 21.94	+ 0.03	49 7 37.4	− 0.2
	21	β Libræ . . .	9	10 37.33	− 1.08	− **10.06**	47 43 53.62	+ 4 40.22	+ 1 3.7	15 10 26 26	+ 0.07	98 55 58.7	+ 2.4
	22	μ¹ Bootis . . .	6	20 3.73	− 0.13	− **9.91**	0 59 54.55	+ 5 24.25	+ 1.1	15 19 53.60	− 0.13	52 11 41.1	+ 1.0
	23	μ² Bootis . . .	5	20 5.11	− 0.13	− 10.00	0 59 54.55	+ 7 11.92	+ 1.1	15 19 54.98	− 3.03	52 13 28.8	−14.8
	24	Comet *b*,1877 s. p.	9	28 7.09	− 7.08	− 10.01	298 55 50.82	+ 6 2.22	− 1 44.2	16 27 50.00	. .	350 6 30.0	. .
	25	*d* Herculis . .	9	57 16.90	− 0.25	− **10.03**	5 3 54.35	+ 5 5.91	+ 5.2	16 57 6.64	+ 0.21	56 15 26.7	+ 1.3
P.	26	Polaris . . .	3	12 14.90	+37.68	− 10.32	310 10 . .	. . .	. .	1 12 42.26	− 4.11	. . . .	. .
	27	η Piscium . .	5	25 5.38	− 0.54	− **10.34**	24 6 . .	. . .	. .	1 24 54.51	+ 0.09	. . . .	. .
	28	β Arietis . . .	9	48 1.88	− 0.45	− **10.38**	18 35 51.75	+ 5 2.16	+ 19.1	1 47 51.09	+ 0.06	69 47 34.2	+ 1.3
	29	α Persei (R.) . .	.	. . .	. .	. .	190 27 48.85	+ 3 47.04	+ 10.4	. . . .	. .	40 34 34.9	− 0.5
	30	α Persei . . .	3	15 42.62	+ 0.28	− 10.40	349 23 55.60	+ 4 30.75	− 10.4	3 15 32.50	+ 0.04	40 34 37.2	+ 1.8
15	31	Sun I, S. . .	9	29 18.61	− 0.44	− 10.41	20 3 52.80	+ 4 38.96	+ 20.5	3 29 7.76	. .	71 15 13.5	. .
	32	Sun II, N. . .	9	31 32.82	− 0.44	− 10 41	19 31 49.52	+ 5 2.75	+ 20.0	3 31 21.97	. .	70 43 33.5	. .
	33	β Orionis . . .	9	8 49.11	− 0.83	− **10 51**	47 7 51.72	+ 5 27.71	+ 59.9	5 8 37.81	+ 0.04	98 20 40.5	+ 2.5
	34	β Tauri . . .	9	18 42.00	− 0.26	− 10.48	10 18 . .	. . .	. .	5 18 31.26	− 0.14	. . . .	. .
	35	ε Orionis . . .	9	30 9.81	− 0 73	− **10.47**	40 5 52.78	+ 3 52.69	+ 46.6	5 29 58.60	− 0.01	91 16 53.3	+ 2.7
	36	α Orionis . . .	5	48 42.28	− 0.60	− **10.51**	31 26 . .	. . .	. .	5 48 31.18	− 0.01	. . . .	. .
	37	α Canis Majoris .	9	39 55.29	− 0.94	− **10.49**	55 20 . .	. . .	. .	6 39 43.82	+ 0.01	. . . .	. .
	38	B. A. C. 4225 .	9	25 32.71	− 0.84	− 10.26	43 9 51.25	+ 5 38.54	+ 53.1	12 25 21.61	− 2.28	94 22 44.1	−16.3
	39	*f* Virginis . . .	9	30 40.71	− 0.85	− 10.26	43 57 50.55	+ 4 24.62	+ 54.8	12 30 29.60	− 2.30	95 9 21.2	−16.7
	40	Lalande 23951 .	9	45 15.12	− 0.94	− 10.26	51 37 52.05	+ 3 32.86	+ 1 11.3	12 45 3.92	− 2.33	102 48 57.4	−18.8
	41	12² Canum Venat. .	9	50 29.61	− 0.10	− **10.16**	359 49 53.55	+ 4 54.11	− 0.1	12 50 19.25	− 0.07	51 1 8.8	+ 2.2
	42	B. A. C. 262, s. p.	7	52 22.43	−12.49	− 10.26	304 25 54.28	+ 4 51.49	− 1 22.0	0 51 59.68	+15.89	355 35 45.0	+ 3.0
	43	θ Virginis . . .	9	3 48.49	− 0.84	− **10.25**	43 41 53.48	+ 4 5.10	+ 54.1	13 3 37.39	− 0.05	94 53 13.9	+ 2.7
	44	Polaris, s. p. .	7	13 35.41	−38.89	− 10.20	307 29 52.02	+ 4 12.69	− 1 13.3	1 12 46.26	− 0.44	358 39 12.6	+ 1.6
	45	α Virginis . . .	9	18 56.59	− 0.91	− **10.31**	49 19 56.72	+ 4 3.27	+ 1 5.9	13 18 45.42	+ 0.02	100 31 27.1	+ 2.1
	46	B. A. C. 4509 .	9	24 17.97	− 0.48	− 10.26	19 7 51.75	+ 4 2.19	+ 19.7	13 24 7.23	− 2.72	70 18 34.8	−12.3
	47	ζ Virginis . . .	9	28 39.23	− 0.77	− **10.31**	38 45 53.52	+ 5 16.56	+ 45.5	13 28 28.20	+ 0.04	89 58 16.8	+ 2.4
	48	B. A. C. 4562 .	5	35 1.48	− 0.46	− 10.26	18 11 53.50	+ 6 57.91	+ 18.7	13 34 50.76	− 2.75	69 25 31.3	−12.6
	49	B. A. C. 4563 .	6	35 1.97	− 0.46	− 10.26	18 11 53.50	+ 3 30.32	+ 18.7	13 34 51.25	− 2.75	69 22 3.7	−12.6
	50	η Ursæ Maj. (R.) .	.	. . .	. .	. .	190 57 49.75	+ 3 53.44	+ 11.0	. . . .	. .	40 4 27.0	− 0.4

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.35	51.5	49.0
30.29	64.6	63.0
30.32	62.6	61.0
30.33	61.2	59.4
30.31	58.1	56.0
30.31	67.5	70.0
30.28	71.5	74.6
30.29	72.5	75.5
30.25	76.5	78.7
30.21	78.2	81.2
30.17	69.8	68.7
50.17	69.7	68.2

For summary of the elements of reduction see page 3.

15, 16, 25. One bisection.
2, 17, 42, 44. Three bisections.
3, 24. Four bisections.

ZENITH-POINT CORR.

No. 1 to 3 + 53.87
No. 4 to 25 + 54.42
No. 28 to 35 + 52.72
No. 38 to 50 + 55.19

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
31	− 3.0	− 15 50.0	. .	− 15 53.0
32	− 2.9	+ 15 50.0	. .	+ 15 47.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument	CORRECTIONS. Refraction	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
May 15	1	η Ursæ Majoris .	4	42 55.08	+ 0.22	− 10.26	348 53 52.40	+ 4 26.06	− 11.0	13 42 45.04	− 0.05	40 4 28.7	+ 1
P.	2	η Bootis . . .	9	49 3.19	− 0.49	− 10.26	19 47 52.85	+ 4 46.37	+ 20.5	13 48 52.44	− 0.05	70 59 20.9	+ 2
	3	50 Cassiopeæ, S. P. .	6	53 8.94	− 3.62	− 10.26	290 41 51.92	+ 3 48.32	− 2 28.1	1 52 55.06	− 0.01	341 49 33.3	+ 3
	4	α Draconis . .	9	1 17.47	+ 1.10	− 10.26	333 51 55.70	+ 4 27.89	− 27.7	14 1 8.31	+ 0.10	25 2 17.1	− 0
	5	α Bootis (R.) . .	.	. . .	. .	. .	160 51 49.30	+ 4 1.79	− 19.6	. . . .	. .	70 10 49.7	+ 1
	6	α Bootis . . .	3	10 16.58	− 0.47	− 10.26	18 59 52.45	+ 4 18.39	+ 19.6	14 10 5.85	0.00	70 10 51.6	+ 3
	7	ε² Bootis . . .	9	39 50.39	− 0.34	− 10.25	11 13 50.52	+ 4 14.60	+ 11.3	14 39 39.80	− 0.06	62 24 37.6	+ 1
	8	α² Libræ . . .	3	44 18.66	− 0.99	− 10.25	54 19 54.78	+ 4 30.92	+ 1 19.1	14 44 7.42	+ 0.06	105 32 6.0	+ 2
	9	β Ursæ Minoris .	3	51 19.05	+ 2.39	− 10.25	324 9 54.30	+ 5 6.58	− 40.9	14 51 11.19	+ 0.07	15 20 41.2	+ 0
	10	β Bootis . . .	9	57 32.19	− 0.06	− 10.25	357 55 52.05	+ 5 26.59	− 2.0	14 57 21.88	− 0.02	49 7 37.8	+ 0
	11	XV, 16 . . .	9	29 58.32	− 1.14	− 10.25	64 51 55.18	+ 5 1.50	+ 2 0.9	15 29 46.93	− 3.04	116 5 18.8	−17
	12	B. A. C. 5199 .	7	39 7.97	− 1.29	− 10.25	73 3 54.90	+ 4 40.11	+ 3 5.2	15 38 56.43	− 3.23	124 18 1.4	−16
	13	B. A. C. 5352 .	5	56 33.24	+ 6.74	− 10.25	315 31 52.38	+ 3 58.13	− 55.6	15 56 29.73	−10 57	6 41 17.1	−13
	14	B. A. C. 1247, S. P.	5	0 3.50	− 8.70	− 10.25	302 21 54.70	+ 3 32.33	− 1 29.2	3 59 44.55	+ 7.76	353 30 19.0	−12
	15	B. A. C. 5435¹ .	6	11 59.63	− 1.24	− 10.25	69 23 53.58	+ 3 35.25	+ 2 30.5	16 11 48.14	− 3.21	120 36 20.5	−14
	16	B. A. C. 5435² .	5	12 0.78	− 1.24	− 10.25	69 23 53.58	+ 3 52.79	+ 2 30.5	16 11 49.29	− 3.21	120 36 38.1	−14
	17	η Draconis . .	9	22 32.73	− 1.08	− 10.25	337 1 54.62	+ 4 50.83	− 24.0	16 22 21.40	− 1.99	28 12 42.6	+ 1
	18	β Herculis . .	9	25 9.30	− 0.44	− 10.25	17 3 51.55	+ 4 15.75	+ 17.5	16 24 58.61	− 2.75	68 14 46.0	−16
	19	Parthenope .	9	33 41.77	− 0.98	− 10.25	53 37 53.20	+ 5 57.35	+ 1 17.4	16 33 30.54	. .	104 51 29.2	− 5
	20	XVI, 17 . . .	9	37 33.48	− 1.19	− 10.25	67 3 55.32	+ 4 25.61	+ 2 14.0	16 37 22.04	− 3.18	118 16 56.1	−13
	21	XVI, 19 . . .	9	39 56.77	− 1.05	− 10.25	58 39 53.12	+ 4 52.60	+ 1 33.4	16 39 45.47	− 3.02	109 52 40.3	−16.
	22	B. A. C. 5671 .	9	47 0.00	− 1.23	− 10.25	69 9 52.52	+ 4 29.41	+ 2 28.9	16 46 48.52	− 3.24	120 23 12.0	−12.
	23	ε Ursæ Minoris .	6	58 49.92	+ 5.70	− 10.25	310 35 51.32	+ 4 47.04	− 53.6	16 58 45.37	− 0.16	7 46 6.0	+ 1.
	24	α¹ Herculis (R.) .	3	. . .	. .	. .	155 33 53.08	+ 4 32.21	− 25.7	. . . .	. .	75 28 21.6	+ 1.
	25	α¹ Herculis . .	3	9 15.75	− 0.55	− **10.19**	24 15 50.90	+ 5 44.40	+ 25.7	17 9 4.95	− 0.04	75 28 22.2	+ 2.
	26	B. A. C, 1662, S. P.	8	23 1.11	−11.40	− 10.25	303 57 52.85	+ 5 10.41	− 1 24.0	5 22 39.46	+ 6.50	355 8 0.5	−17.
	27	μ Herculis . .	9	41 51.77	− 0.32	− **10.22**	11 1 54.38	+ 4 13.11	+ 11.2	17 41 41.20	+ 0.01	62 12 39.9	+ 1.
	28	γ Draconis (R.) .	.	. . .	. .	. .	192 31 52.00	+ 4 11.45	+ 12.7	. . . .	. .	38 30 5.1	0.
	29	γ Draconis . .	5	53 57.52	+ 0.32	− 10.24	347 19 53.92	+ 4 3.90	− 12.7	17 53 47.60	− 0.08	38 30 6.3	+ 1.
	30	γ² Sagittarii . .	9	58 9.10	− 1.23	− **10.28**	69 11 53.98	+ 4 47.17	+ 2 29.3	17 57 57.63	+ 0.03	120 25 31.7	+ 0.
	31	22 Camelop., S. P. .	9	5 30.84	− 3.24	− 10.24	288 13 50.25	+ 4 29.94	− 2 50.3	6 5 17.36	+ 0.11	339 21 51.1	0.
	32	Jupiter I, N. .	5	11 21.60	− 1.10	− 10.24	61 51 53.68	+ 4 7.34	+ 1 46.4	18 11 10.26	. .	113 4 8.6	+19.
	33	Jupiter II, S. .	6	11 24.80	− 1.10	− 10.24	61 51 53.68	+ 4 49.93	+ 1 46.4	18 11 13.46	. .	113 4 51.2	−23.
	34	δ Ursæ Minoris .	4	12 6.38	+14.31	− 10.21	312 13 50.82	+ 4 40.73	− 1 2.5	18 12 10.45	+ 1.54	3 23 50.3	+ 0.
	35	O. Arg. S. 18436	6	29 29.27	− 1.18	− 10.24	66 35 52.62	+ 5 21.27	+ 2 11.4	18 29 17.85	− 3.02	117 49 46.5	− 5.
	36	α Lyræ . . .	7	32 59.05	− 0.08	− **10.29**	0 9 51.38	+ 3 52.29	+ 0.2	18 32 48.73	+ 0.08	51 20 5.1	− 0.
16	37	Polaris . . .	5	12 35.02	+18.31	− 10.33	310 9 51.12	+ 5 13.63	− 1 5.3	1 12 43.00	− 4.67	1 20 50.7	+ 1.
F.	38	η Piscium . . .	9	25 5.08	− 0.28	− **10.26**	24 6 . .	. .	. .	1 24 54.47	+ 0.01	. . . .	. .
	39	α Ceti	9	56 1.93	− 0.33	− **10.34**	35 12 . .	. .	. .	2 55 51.33	+ 0.08	. . . .	. .
17	40	α Aurigæ . . .	9	7 46.59	+ 0.07	− **10.17**	352 57 47.02	+ 3 35.10	− 6.6	5 7 36.47	− 0.03	44 7 36.7	+ 2.
	41	β Orionis . . .	9	8 48.37	− 0.38	− **10.22**	47 7 50.25	+ 5 27.96	+ 58.6	5 8 37.80	+ 0.03	98 20 38.0	+ 0.
	42	12¹ Canum Venat. .	6	50 28.22	− 0.04	− 10.04	359 49 45.52	+ 5 14.97	− 0.1	12 50 18.14	− 2.99	51 1 21.6	− 5.
	43	12² Canum Venat. .	5	50 29.41	− 0.04	− **10.04**	359 49 45.52	+ 5 1.36	− 0.1	12 50 19.33	+ 0.03	51 1 8.0	+ 1.
	44	θ Virginis . . .	9	3 47.81	− 0.37	− **10.05**	43 41 46.12	+ 4 12.00	+ 53.2	13 3 37.40	− 0.03	94 53 12.5	+ 1.
	45	Polaris, S. P. .	5	13 13.58	−20.25	− 10.03	307 29 49.82	+ 4 14.17	− 1 12.1	1 12 43.30	− 4.67	358 39 13.1	+ 2.
	46	Virginis . . .	9	18 55.90	− 0.41	− **10.13**	49 19 52.10	+ 4 9.32	+ 1 4.8	13 18 45.46	+ 0.07	100 31 27.4	+ 2.
	47	ζ Virginis . .	9	28 38.56	− 0.35	− **10.07**	38 45 47.12	+ 5 23.08	+ 44.8	13 28 28.18	+ 0.03	89 58 16.2	+ 1.
	48	η Bootis . . .	9	49 2.62	− 0.24	− **9.93**	19 47 39.60	+ 4 58.08	+ 20.1	13 48 52.36	− 0.13	70 59 19.0	+ 1.
	49	ε Bootis . . .	6	39 49.99	− 0.17	− **9.94**	11 13 45.88	+ 4 19.70	+ 11.2	14 39 39.82	− 0.05	62 24 38.0	+ 2.
	50	α² Libræ . . .	9	44 17.80	− 0.45	− 10.00	54 19 53.48	+ 4 33.14	+ 1 17.9	14 44 7.35	− 0.02	105 32 5.7	+ 2.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
5	30.17	67.8	66.7
10	30.15	66.5	65.2
14	30.13	65.6	64.4
28	30.11	64.6	63.3
36	30.10	64.0	62.8
37	30.04	73.5	76.2
39	30.12	80.2	83.2
41	30.10	83.4	88.2

For summary of the elements of reduction see page 3.

2. Four bisections.
12, 35. One bisection.
37. Three bisections.
45. Five bisections.

ZENITH-POINT CORR.

No. 1 to 36 + 55.19″
No. 37 to 41 + 56.10
No. 42 to 50 + 57.49

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
32	− 1.8	+ 21.3	. .	+ 19.5
33	− 1.8	− 21.3	. .	− 23.1

E D R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS Instrument.	CORRECTIONS Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
7.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
17	1	β Libræ	9	10 36.60	− 0.42	− 9.99	47 43 50.88	+ 4 46.61	+ 1 1.7	15 10 26.19	− 0.02	98 56 0.4	+ 4.1
	2	γ² Ursæ Min. (R.)	.	. . .	. .	. .	213 17 43.45	+ 4 11.64	+ 36.8	. . . .	. .	17 43 49.3	− 3.0
	3	γ² Ursæ Minoris	3	21 11.09	+ 0.94	− 9.99	326 33 42.90	+ 4 27.21	− 36.8	15 21 2.04	+ 0.50	17 43 54.5	+ 2.2
	4	α Cor. Borealis	5	29 41.90	− 0.18	− **9.98**	11 41 50.98	+ 4 5.38	+ 11.7	15 29 31.73	0.00	62 52 29.3	+ 2.1
	5	α Serpentis	9	38 25.73	− 0.33	− **9.96**	31 59 54.20	+ 4 37.27	+ 35.1	15 38 15.42	+ 0.01	83 11 27.8	+ 2.3
	6	ε Serpentis	9	44 54.32	− 0.34	− **10.02**	33 57 56.78	+ 4 24.56	+ 37.8	15 44 44.00	+ 0.03	85 9 20.3	+ 1.9
	7	ε Cor. Bor. (R.)	.	. . .	. .	. .	168 15 47.02	+ 4 35.13	− 11.6	. . . .	. .	62 46 10.6	+ 2.8
	8	ε Cor. Borealis	.	. . .	. .	. .	11 35 48.40	+ 3 48.66	+ 11 6	. . . .	. .	62 46 9.9	+ 2.1
	9	Hebe.	9	6 25.11	− 0.35	− 9.97	36 21 53.32	+ 5 48.83	+ 41.4	16 6 14.79	. .	87 34 44.8	− 3.0
	10	Parthenope.	9	31 54.66	− 0.46	− 9.96	53 33 50.52	+ 6 20.82	+ 1 16.2	16 31 44.24	. .	104 47 48.7	− 5.2
	11	κ Ophiuchi	9	52 3.82	− 0.32	− **9.95**	29 13 49.78	+ 5 33.02	+ 31.6	16 51 53.54	+ 0.06	80 26 15.6	+ 5.0
	12	Anonymous	3	57 11.13	− 0.41	− 9.96	43 21 51.65	+ 8 11 04	+ 53.3	16 57 0.76	− 2.84	94 37 17.2	−14.5
	13	Juno.	8	57 11.77	− 0.41	− 9.96	43 21 51.65	+ 6 44.44	+ 53.2	16 57 1.40	. .	94 35 50.5	− 2.6
	14	Polaris	5	12 46.92	+ 7.67	− 9 95	310 9 47.92	+ 5 44.30	− 1 5.0	1 12 44 64	− 3.63	1 20 48.4	− 1.1
	15	θ¹ Ceti	8	18 3.19	− 0.05	− **10.08**	47 37 47.20	+ 3 46.95	+ 1 0.5	1 17 53.19	+ 0.13	98 48 55.9	0.0
	16	β Arietis	9	48 0.92	− 0.01	− **9.79**	18 35 54.70	+ 4 59.68	+ 18.6	1 47 50 98	− 0.12	69 47 34.2	+ 1.4
	17	50 Cassiopeæ	9	53 4.70	+ 0.43	− 9.93	326 59 55.85	+ 4 50.36	− 35.6	1 52 55.20	0.00	18 10 31.8	+ 1.2
	18	α Arietis	3	0 24 62	0.00	− **9.88**	15 55 56.48	+ 4 33.83	+ 15.8	2 0 14.70	− 0.03	67 7 7.3	+ 0.5
	19	ξ¹ Ceti	6	6 39.22	− 0.02	− **9 97**	30 32 . .	. .	. .	2 6 29.28	+ 0.13	. . . .	. .
	20	ι Cassiopeæ	9	19 4.90	+ 0.31	− 9.91	331 57 50.85	+ 5 21.36	− 29.1	2 18 55.30	− 0.01	23 9 4.3	− 1.3
18	21	Sun I, N.	9	41 11.82	+ 0.02	− 9.87	18 51 41.80	+ 4 43.23	+ 18.7	3 41 1.97	+67 37	70 3 4.9	. .
	22	Sun II, S.	9	43 26.57	+ 0.02	− 9.87	19 23 42.75	+ 4 20.36	+ 19.2	3 43 16.72	−67.38	70 34 43.5	. .
	23	β Orionis	9	8 47.64	0.00	− **9.87**	47 7 52.32	+ 5 28.28	+ 58.2	5 8 37.82	+ 0.05	98 20 40.0	+ 2.4
	24	3 Tauri	9	18 41.09	+ 0.06	− **9.73**	10 17 50.38	+ 5 25.40	+ 10.0	5 18 31.34	− 0.07	61 29 47.0	+ 1.8
	25	δ Orionis	9	25 53.51	+ 0.01	− **9.86**	39 11 53.08	+ 4 29.48	+ 44.4	5 25 43.71	+ 0.02	90 23 28.2	+ 2.7
	26	Moon I, N.	9	5 10.60	− 0.04	− 9.6	20 11 42.95	+ 3 13 85	+ 19.8	9 5 0.89	+71.26	71 21 37.8	. .
	27	ε Leonis	9	39 3.49	− 0.04	− **9.68**	14 27 49.65	+ 5 13.60	+ 14.0	9 38 53.77	− 0.03	65 39 38.4	+ 2.8
	28	α Leonis	9	2 0.58	− 0.06	− **9.64**	26 13 51.55	+ 5 23.44	+ 26.6	10 1 50.86	− 0.06	77 26 2.8	+ 3.0
	29	γ Ursæ Maj. (R.)	.	. . .	. .	. .	195 23 50.92	+ 5 2.99	+ 15.2	. . . .	. .	35 37 12.1	— 2.3
	30	γ Ursæ Majoris	.	. . .	. .	. .	344 27 51.62	+ 3 19.37	− 15.2	. . . .	. .	35 37 17.0	+ 2.6
	31	ο Virginis (R.)	.	. . .	. .	. .	150 27 53.68	+ 3 45.11	− 31.0	. . . .	. .	80 35 13.4	+ 1.3
	32	ο Virginis	.	. . .	. .	. .	29 23 53.45	+ 4 27.60	+ 31.0	. . . .	. .	80 35 13.2	+ 1.1
	33	Polaris, S. P.	4	13 0.75	− 6.29	− 9.61	307 29 52.45	+ 4 10.96	− 1 11.7	1 12 41.85	− 3.71	358 39 12.9	+ 2.5
	34	α Virginis	9	18 55.06	− 0.09	− **9.61**	49 19 58.32	+ 4 2.39	+ 1 4.5	13 18 45.36	− 0.03	100 31 26.4	+ 1.4
	35	ζ Virginis	9	28 37.88	− 0.11	− **9.63**	38 45 54.58	+ 5 17.13	+ 44.7	13 28 28.17	+ 0.02	89 58 17.6	+ 3.3
	36	B. A. C. 4595	9	41 12.08	− 0.06	− 9 60	359 39 55.68	+ 6 40.38	− 0.2	13 41 2.42	− 3.09	50 52 57.1	− 8.5
	37	B. A. C. 4600	9	41 54.22	− 0.06	− 9.60	359 39 55.68	+ 4 22.65	− 0 3	13 41 44.56	− 3.09	50 50 39.2	− 8.5
	38	η Bootis	7	49 2.12	− 0.10	− **9.57**	19 47 50.88	+ 4 48.63	+ 20.1	13 48 52.42	− 0.07	70 59 20.8	+ 3.0
	39	50 Cassiopeæ, S. P.	9	53 5.32	− 0.67	− 9.59	290 41 53.78	+ 3 42.00	− 2 25 4	1 52 55.06	− 0.16	341 49 31.6	+ 0.9
	40	ι Cassiopeæ, S. P.	9	19 5.78	− 0.57	− 9.58	285 43 54.42	+ 3 55.23	− 3 13.8	2 18 55.63	+ 0.30	336 50 57.0	+ 2.7
	41	B. A. C. 4818	9	29 13.81	− 0.07	− 9.58	78 25 54.82	+ 4 3.23	+ 4 26.2	14 29 4.16	− 3.08	129 40 45.4	−21.1
	42	B. A. C. 4967	9	58 48.04	+ 0.04	− 9.57	338 7 54.70	+ 5 0.92	− 22.3	14 58 38.51	− 4.00	29 18 54.5	−10.1
	43	B. A. C. 5035	9	11 5.82	− 0.08	− 9.56	79 1 55.45	+ 7 29.01	+ 1 42.4	15 10 56.18	− 3 32	130 20 28.1	−18.8
	44	B. A. C. 5046	8	13 31 21	− 0.08	− 9.56	79 1 55.45	− 31.34	+ 4 39.0	15 13 21 57	− 3.33	130 12 24.3	−18.6
	45	Lacaille 6328	8	13 43.73	− 0.08	− 9.56	79 1 55.45	+ 5 32.72	+ 4 41.0	15 13 34.09	− 3.34	130 18 31.0	−18.6
	46	Hebe	9	5 28.53	− 0.12	− 9.54	36 17 54.38	+ 6 51.81	+ 41.2	16 5 18.87	. .	87 31 48.6	− 3.0
	47	B. A. C. 5451	9	15 10.11	− 0.09	− 9.54	75 53 55.30	+ 4 11.27	+ 3 39.4	16 15 0.48	− 3.45	127 8 7.2	−15 8
	48	α Scorpii	9	22 4.81	− 0.10	− **9.46**	64 55 55.18	+ 5 27.39	+ 1 59.3	16 21 55.17	− 0.10	116 9 43.1	+ 3.3
	49	Parthenope	9	30 59.56	− 0.11	− 9.53	53 31 53.32	+ 6 30.91	+ 1 15 8	16 30 49.92	. .	104 46 1.2	− 5.2
	50	η Herculis	9	38 53 17	+ 0.05	− **9.61**	359 39 54.92	+ 4 35.55	− 0.3	16 38 43 72	+ 0.08	50 50 51.4	+ 2.2

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.09	72.0	71.0
30.06	71.0	69.2
30.16	77.6	80.9
30.16	82.5	83.8
30.13	84.7	87.4
30.10	88.9	91.0
30.04	88.5	92.6
30.04	78.6	77.5
30.04	76.2	75.1
30.02	73.2	71.7

For summary of the elements of reduction see page 3

7, 8, 20. One bisection.
14, 26, 33. Three bisections.
17. Four bisections.

ZENITH-POINT CORR

No. 1 to 13 + 57.49″
No. 14 to 25 + 57.10
No. 26 to 50 + 58.21

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
21	− 2.8	+ 15 49.3	. .	+ 15 46.5
22	− 2.9	− 15 49.3	. .	− 15 52.2
26	− 20 21.6	+ 16 13.2	. .	− 4 8.4

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
May 18	1	κ Ophiuchi . .	9	52 3.20	− 0.12	− **9.52**	29 13 53.38	+ 5 27.77	+ 31.4	16 51 53.56	+ 0.07	80 26 13.8	+
S.	2	Jupiter I, S. .	6	10 16.20	− 0.12	− 9.49	61 51 55.32	+ 5 22.11	+ 1 44.6	18 10 6.59	+ 1.66	113 5 23.2	−2
	3	Jupiter II, N. .	5	10 19.52	− 0.12	− 9.49	61 51 55.32	+ 4 37.93	+ 1 44.6	18 10 9.91	− 1.66	113 4 39.0	+2
	4	Comet b, 1877 s.p.	9	52 23.10	− 0.73	− 9.48	295 19 57.62	+ 5 30.58	− 1 57.1	18 52 12.89	. .	346 29 58.3	.
	5	d Sagittarii . .	9	10 38.62	− 0.13	− **9.47**	57 57 54.72	+ 4 30.88	+ 1 30.0	19 10 29.02	+ 0.03	109 10 16.8	+
21	6	Polaris . . .	3	13 11.03	−12.25	− 9.19	310 9 54.72	+ 5 39.30	− 1 4.3	1 12 49.59	− 1.13	1 20 50.9	+
	7	o Piscium . .	9	39 3.40	+ 0.35	− **9.28**	30 15 53.58	+ 4 50.73	+ 31.8	1 38 54 57	+ 0.05	81 27 37.3	+
	8	β Arietis . .	9	48 0.07	+ 0.26	− **9.12**	18 35 57.30	+ 4 57.87	+ 18.4	1 47 51.14	− 0.05	69 47 34.8	+
	9	50 Cassiopeæ . .	6	53 5.36	− 0.57	− 9.19	326 59 55.85	+ 4 49.87	− 35.1	1 52 55.60	+ 0.19	18 10 31.8	+
	10	α Arietis . .	9	0 23.74	+ 0.25	− **9.16**	15 55 53.08	+ 4 38.48	+ 15.5	2 0 14.80	− 0.02	67 7 8.3	+
22	11	12^1 Canum Venat. .	6	50 26.95	+ 0.15	− 9.07	359 49 52.18	+ 5 7.39	− 0.1	12 50 18.03	− 2.94	51 1 20.7	−
	12	12^2 Canum Venat. .	5	50 28.23	+ 0.15	− **9.10**	359 49 52.18	+ 4 54.67	− 0.1	12 50 19.31	+ 0.06	51 1 7.9	+
	13	50 Virginis . .	9	3 30.22	+ 0.50	− 9.08	48 27 56.12	+ 5 21.24	+ 1 2.8	13 3 21.64	− 2.40	99 40 41.4	−1
	14	Polaris, s. p. .	5	12 51.18	+12.48	− 9.09	307 29 50.90	+ 4 11.55	− 1 12.1	1 12 52.57	+ 1.49	358 39 11.5	+ 1
	15	α Virginis . .	9	18 53.97	+ 0.51	− **9.13**	49 19 55.08	+ 4 6.34	+ 1 4.8	13 18 45 38	0.00	100 31 27.4	+
	16	η Bootis . .	9	49 1.19	+ 0.31	− **9 06**	19 47 52.65	+ 4 46.34	+ 20.1	13 48 52.37	− 0.11	70 59 20.3	+ 3
	17	B. A. C. 4674 .	8	56 4.81	+ 0.68	− 9.13	69 51 55.90	+ 5 8.63	+ 2 31.0	13 55 56.26	− 2.75	121 5 56.7	−22
	18	B. A. C. 4737 .	9	11 47.26	+ 0.33	− 9.15	22 57 54.45	+ 5 36.63	+ 23.7	14 11 38.44	− 2.77	74 10 16.0	−13
	19	Groom. 2097 .	9	14 4.49	+ 0.15	− 9.15	359 27 54.68	+ 5 40.77	− 0.4	14 13 55.49	− 3.11	50 39 56.2	− 9
	20	B. A. C. 4758 .	9	14 56.78	+ 0.15	− 9.15	359 27 54.68	+ 4 18.86	− 0.4	14 14 47.78	− 3.11	50 38 34.3	− 9
	21	B. A. C. 4818 .	9	29 12.81	+ 0.78	− 9.16	78 25 57.25	+ 4 2.06	+ 4 25.9	14 29 4.43	− 3.09	129 40 46.4	−21
	22	B. A. C. 4870 .	9	39 10.29	+ 0 13	− 9.17	357 49 53.62	+ 5 9.03	− 2.0	14 39 1.25	− 3.16	49 1 21.8	−10
	23	B. A. C. 4903 .	9	45 7.97	+ 0.08	− 9.18	352 12 . .	. . .	. .	14 44 58.87	− 3.31	. . . .	.
	24	β^1 Scorpii . .	7	58 29.07	+ 0.58	− **9.33**	58 15 56.32	+ 4 32.06	+ 1 30.2	15 58 20.40	+ 0.14	109 28 19.8	+ 2
	25	Hebe . . .	9	1 41.31	+ 0.42	− 9.25	36 7 59 32	+ 7 8.60	+ 40.9	16 1 32.48	. .	87 22 10.0	− 3
	26	δ Ophiuchi . .	9	8 5.74	+ 0.46	− **9.23**	42 9 55.05	+ 5 44.86	+ 50.7	16 7 56.94	− 0.01	93 22 51.8	+ 3
	27	α Scorpii . .	9	22 3.90	+ 0.63	− **9.21**	64 55 57.70	+ 5 22.90	+ 1 59.2	16 21 55.26	− 0.08	116 9 41.0	+ 1
P.	28	Polaris . . .	7	13 0.39	+ 2.96	− 9.42	310 10 . .	. . .	. .	1 12 54.13	+ 2.69	. . . .	.
	29	α Arietis . .	9	0 24.09	+ 0.18	. .	15 55 54.58	+ 4 36.34	+ 16.1	. . . .	. .	67 7 8.2	+ 1.
23	30	o Virginis . .	9	59 8.11	+ 0.16	− **9.45**	29 23 55.10	+ 4 25.73	+ 31.8	11 58 58.82	− 0.04	80 35 13.8	+ 2.
	31	B. A. C. 4092 .	9	2 44.29	+ 0.21	− 9.45	79 17 57.82	+ 4 3.45	+ 4 50.3	12 2 35.05	− 1.88	130 33 12.8	−24.
	32	4 Draconis . .	5	6 40.84	+ 0.37	− 9.45	320 51 54.15	+ 4 26.61	− 46.3	12 6 31.76	− 0.47	11 41 55.7	− 0.
	33	η Virginis . .	9	13 48.37	+ 0.16	− **9.52**	38 47 57.18	+ 4 10.75	+ 45.4	12 13 39.07	+ 0.05	89 59 14.5	+ 1.
	34	B. A. C. 4165 .	3	15 7.83	− 2.28	− 9.46	310 27 55.08	+ 3 50.60	− 1 5.9	12 14 56.09	−41.96	1 37 1.0	+ 6.
	35	B. A. C. 4209 .	9	23 29.61	+ 0.17	− 9.46	14 1 51.30	+ 4 20.88	+ 14.2	12 23 20.32	− 2.54	65 12 47.6	− 7.
	36	β Corvi	9	28 7.20	+ 0.18	− **9 51**	61 29 55.90	+ 5 19 45	+ 1 44.0	12 27 57.91	+ 0.05	112 43 20.6	+ 2.
	37	21 Cassiopeæ, s. p. .	5	37 40.44	− 0.12	− 9.48	293 9 54.65	+ 4 46.21	− 2 10.8	0 37 30.84	+ 0.38	344 18 51.3	+ 3.
	38	32^1 Camelopardalis	5	48 28.28	+ 0.64	− 9.48	314 45 54.50	+ 3 26.84	− 56.9	12 48 19.44	−13.13	5 54 45.6	+ 0.
	39	32^2 Camelopardalis	5	48 35.90	+ 0.64	− 9.48	314 45 54.50	+ 3 44.99	− 56.9	12 48 27.06	− 0.57	5 55 3.8	− 0.
	40	12^2 Canum Venat. .	9	50 28.47	+ 0.17	− **9.37**	359 50 . .	. . .	. .	12 50 19.16	+ 0.08	. . . .	.
	41	B. A. C. 262, s.p. .	5	52 12.12	− 0.64	− 9.49	304 25 56.95	+ 4 47.50	− 1 22.1	0 52 1.99	−14.02	355 35 43.5	+ 4.
	42	B. A. C. 4389. .	9	0 32.50	+ 0.18	− 9.49	352 53 56.45	+ 4 17.93	− 7.0	13 0 23.19	− 3.16	44 4 28.6	− 3.
	43	Polaris, s. p. . .	7	13 6.19	− 2.19	− 9.50	307 29 54.48	+ 4 9.86	− 1 13.5	1 12 54.50	+ 2.68	358 39 12.0	+ 2.
	44	Durch. 8°, 2710 .	9	20 28.60	+ 0.16	− 9.51	30 45 58.18	+ 4 58.66	+ 33.8	13 20 19.25	− 2.56	81 57 51.8	−14.
	45	B. A. C. 4509 .	9	24 16.50	+ 0.17	− 9.51	19 7 54.15	+ 3 57.19	+ 19.7	13 24 7.16	− 2.68	70 18 32.2	−11.
	46	Moon I, N. . .	9	27 7.17	+ 0.17	− 9.52	52 35 56.30	+ 4 24.29	+ 1 14.2	13 26 57.82	+67.20	103 47 56.0	. .
	47	B. A. C. 4562 .	5	35 0.06	+ 0.16	− 9.52	18 11 53.08	+ 6 57.04	+ 18.8	13 34 50.70	− 2.72	69 25 30.1	−11.
	48	B. A. C. 4563 .	6	35 0.48	+ 0.16	− 9.52	18 11 53.08	+ 3 28.20	+ 18.7	13 34 51.12	− 2.73	69 22 1.2	−11.
	49	B. A. C. 4595 .	9	41 11.73	+ 0.16	− 9.53	359 39 53.88	+ 6 41.20	− 0.2	13 41 2.36	− 3.06	50 52 56.1	− 7.
	50	B. A. C. 4600 .	9	41 53.78	+ 0.16	− 9.53	359 39 53.88	+ 4 23.46	− 0.3	13 41 44.41	− 3.06	50 50 38.2	− 7.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.02	72.7	71.1
5	30.02	72.0	70.0
6	29.66	76.3	78.0
10	29.65	80.2	81.0
11	29.66	71.0	68 2
25	29.69	67.5	66.8
27	29.70	68.0	66.0
29	29.84	67.0	67.3
30	29.80	65.0	63.8
36	29.81	64.2	62 2
43	29.80	62.4	60.7

For summary of the elements of reduction see page 3.

14, 34, 46. Three bisections.
4, 7. Four bisections.
43. Five bisections.

ZENITH-POINT CORR.

No. 1 to 5	+ 58.″21
No. 6 to 10	+ 59.34
No. 11 to 27	+ 60.28
No. 29	+ 55.55
No. 30 to 50	+ 56.01

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 1.8	− 22.1	. .	− 23.9
3	− 1.8	+ 22.1	. .	+ 20.3
46	−45 48.0	+ 15 46.8	. .	− 30 1.2

TE D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH-DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
'7.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h m. s.	s.	° ′ ″	″
23	1	50 Cassiopeæ, s. P.	9	53 5.49	− 0.07	− 9.54	290 41 51.55	+ 3 46.44	− 2 28.6	1 53 55.88	+ 0.38	341 49 30.6	+ 2.2
	2	B. A. C. 4905² (R.)	.	. . . .	. .	. .	100 37 56.02	+ 5 15.18	− 20.0	. . . .	. .	70 23 30.0	−13.8
	3	B. A. C. 4905²	.	. . . .	. .	. .	19 11 52 08	+ 4 57.16	+ 20.0	. . . .	. .	70 23 30.4	−13.8
	4	B. A. C. 908, s. P.	9	52 50.91	− 0.20	− 9.59	299 49 55.48	+ 4 57.21	− 1 39.9	2 52 41.12	+ 5.92	350 59 34.0	− 5.9
	5	B. A. C. 4982	9	59 4.19	+ 0.49	− 9.60	315 49 53.82	+ 3 52.36	− 55.3	14 58 55.08	−11.12	6 59 12.1	− 6.5
	6	48 Cephei, s. P.	9	4 53.61	− 0.11	− 9.60	296 7 58.52	+ 4 30.71	− 1 55.5	3 4 43.90	+ 0.89	347 16 54.9	+ 3.3
	7	B. A. C. 5035	9	11 5.66	+ 0.17	− 9.60	79 1 54.25	+ 7 24.95	+ 4 49.5	15 10 56.22	− 3.37	130 20 29.9	−19.5
	8	B. A. C. 5046	8	13 31.11	+ 0.17	− 9.61	79 1 54.25	− 40.92	+ 4 46.1	15 13 21.67	− 3.38	130 12 20.0	−19.4
	9	Lacaille 6328	8	13 43.67	+ 0.17	− 9.61	79 1 54.25	+ 5 24.57	+ 4 48.7	15 13 34.23	− 3.38	130 18 28.7	−19.4
	10	B. A. C. 5135¹	5	29 7.90	+ 0.16	− 9.63	27 51 5 .68	+ 4 25.21	+ 30.4	15 28 58.43	− 2.86	79 3 15.5	−15.4
	11	B. A. C. 5135²	6	29 7.93	+ 0.16	− 9.63	27 51 55.68	+ 4 24.84	+ 30.4	15 28 58.46	− 2.86	79 3 12.1	−15.4
	12	α Serpentis (R.)	.	. . . .	. .	. .	147 51 54.05	+ 3 30.82	− 35.9	. . . .	. .	83 11 26.2	+ 1.5
	13	α Serpentis	.	. . . .	. .	. .	31 59 57.52	+ 4 31.34	+ 35.9	. . . .	. .	83 11 26.0	+ 1.3
	14	ζ Ursæ Minoris	5	48 44.68	+ 0.33	− 9.64	320 39 55.75	+ 4 22.91	− 46.9	15 48 35.57	− 0.51	11 49 53.0	+ 1.8
	15	ε Cor. Borealis	3	52 41.83	+ 0.16	(− **9.28**)	11 33 54.88	+ 5 40.60	+ 11.8	15 52 32.34	− 0.41	62 40 8.5	+ 2.1
	16	β¹ Scorpii	9	58 29.76	+ 0.15	− **9.58**	58 15 58.52	+ 4 25.21	+ 1 32.8	15 58 20.26	− 0.01	109 28 17.7	+ 0.1
	17	δ Ophiuchi	9	8 6.53	+ 0.15	**9.70**	42 10 . .	. . .	. .	16 7 57.02	+ 0.06	. . . .	. .
	18	α Scorpii	9	22 4.86	+ 0.16	− **9.69**	64 56 . .	. . .	. .	16 21 55.35	0.00	. . . .	. .
24	19	Polaris, s. P.	3	13 23.70	−22.14	− 9.19	307 30 . .	. . .	. .	1 12 52.37	− 0.25	. . . .	. .
	20	η Ursæ Maj. (R.)	.	. . . .	. .	. .	190 58 4.00	+ 3 40.50	+ 11.4	. . . .	. .	40 4 25.3	− 0.1
	21	η Ursæ Maj.	3	42 53.93	+ 0.15	− 9.21	318 54 6.95	+ 4 10.21	− 11.4	13 42 44.87	− 0.12	40 4 27.0	+ 1.6
	22	η Bootis	9	49 1.88	− 0.27	− **9.17**	19 47 51.70	+ 4 46.26	+ 21.1	13 48 52.40	− 0.08	70 59 20.3	+ 3.4
	23	α Bootis	8	10 15.36	− 0.25	− **9 24**	18 59 56.72	+ 4 11.77	+ 20.2	14 10 5.88	+ 0.03	70 10 49.9	+ 2.9
	24	Moon I, N.	9	20 15.76	− 0.61	− 9.24	58 8 3.58	+ 4 21.49	+ 1 34.1	14 20 5.91	+68.61	109 20 20.4	. .
	25	Anonymous.	9	30 59.43	− 0.63	− 9.25	60 17 56.00	+ 4 44.58	+ 1 42.6	14 30 49.55	− 2.85	111 30 44.4	−19.9
	26	ε Bootis	9	39 49.28	− 0.16	− **9.24**	11 14 0 85	+ 3 59.32	+ 11.7	14 39 39.86	− 0.01	62 24 33.1	− 1.0
	27	α² Libræ	8	44 17.28	− 0.56	− **9.32**	54 19 58.00	+ 4 25.48	+ 1 21.6	14 44 7.46	+ 0.06	105 32 6.3	+ 2.0
	28	β Ursæ Minoris	9	51 18.86	+ 1.47	− 9.27	324 9 58.28	+ 5 1.98	− 42.1	14 51 11.06	+ 0.17	15 20 39.4	+ 0.9
	29	B. A. C. 5017	9	8 12.36	− 0 86	− 9.28	79 45 56.20	+ 4 44.70	+ 5 15.9	15 8 2.22	− 3.38	131 2 18.0	−19.9
	30	B. A. C. 5054	9	14 13.73	− 0.78	− 9.29	74 33 54.70	+ 5 23.75	+ 3 30.2	15 14 3.66	− 3.27	125 49 9.8	−19.3
	31	B. A. C. 5069	9	17 35.41	− 0.82	− 9.29	77 3 59.50	+ 3 33 63	+ 4 10.9	15 17 25.30	− 3.35	128 18 5.2	−19.2
	32	α Cor. Bor. (R.)	.	. . . .	. .	. .	168 9 54.95	+ 4 12.07	− 12.2	. . . .	. .	62 52 26.4	+ 0.7
	33	α Cor. Borealis	.	. . . .	. .	. .	11 41 54.38	+ 4 0.14	+ 12.2	. . . .	. .	62 52 27.9	+ 2.2
	34	B. A. C. 5199	9	39 6.60	− 0.76	− 9.31	73 3 58.75	+ 4 32.69	+ 3 11.1	15 38 56.53	− 3.35	124 18 3.7	−17.7
	35	O. Arg. N. 15653	9	43 51 27	+ 0.35	− 9.32	343 1 58.45	+ 1 4.13	− 17.9	15 43 42.30	− 3.54	34 9 5.9	−11.6
	36	B. A. C. 5248	9	44 52.27	+ 0.35	− 9.32	343 1 58.45	+ 6 57.53	− 17.8	15 44 43.30	− 3.53	34 14 59.4	−11.6
	37	B. A. C. 5311	9	55 27.21	− 0.81	− 9 33	76 59 51.00	+ 5 20.93	+ 4 10.5	15 55 17.07	− 3.52	128 15 43.6	−16.6
	38	Hebe.	9	59 48.43	− 0.39	− 9.33	36 6 0.38	+ 5 35.79	+ 42.9	15 59 38.71	. .	87 18 40.3	− 3.0
	39	δ Ophiuchi	9	8 6.73	− 0.45	− **9.29**	42 9 58.20	+ 5 38.20	+ 53.3	16 7 56.94	− 0.03	93 22 50.9	+ 2.6
	40	α Scorpii	9	22 5.44	− 0.67	− **9.42**	64 55 57.22	+ 5 17.55	+ 2 5.3	16 21 55.42	+ 0.05	116 9 41.3	+ 1.2
	41	Parthenope.	9	25 19.76	− 0.55	− 9.35	53 22 4.65	+ 6 28.21	+ 1 19.1	16 25 9.86	. .	104 36 13.2	− 5.3
	42	η Herculis.	9	38 53.03	+ 0 02	− **9.34**	359 39 56.92	+ 4 33.20	− 0.3	16 38 43.69	− 0.02	50 50 51.0	+ 3.5
	43	Weisse 958	9	52 2.29	− 0.44	− 9.38	42 57 56.08	+ 4 6.64	+ 54.8	16 51 52 47	− 2.95	94 9 19.3	−14.3
25	44	Polaris	5	12 30.82	+32.20	− 9.38	310 10 17.85	+ 5 18.72	− 1 7.4	1 12 53.64	− 0.26	1 20 50.4	− 0.6
	45	η Piscium	8	25 4.55	− 0.36	− **9.43**	24 6 3.98	+ 4 25.23	+ 25.6	1 24 54.78	+ 0.10	75 17 16.0	+ 2.8
	46	ο Piscium	9	39 4.43	− 0.44	− **9.43**	30 15 50.35	+ 4 51.60	+ 33.5	1 38 54.56	− 0.05	81 27 36.7	+ 1.1
	47	β Arietis	9	48 1.01	− 0.28	− **9.43**	18 35 51.08	+ 5 1.67	+ 19.3	1 47 51.28	0.00	69 47 33.3	+ 1.0
	48	50 Cassiopeæ	5	53 3.30	+ 1.76	− 9.46	326 59 49.58	+ 5 0.56	− 36.9	1 52 55.60	− 0.05	18 10 34.4	+ 2.4
	49	ξ¹ Ceti	8	6 39.31	− 0.44	− **9.47**	30 31 54.55	+ 4 56.42	+ 33.7	2 6 29.38	+ 0.06	81 43 45.9	+ 1.8
	50	ι Cassiopeæ	5	19 4.35	+ 1.05	− 9.51	331 57 54.22	+ 5 21.20	− 30.2	2 18 55.89	+ 0.25	23 9 6.4	− 0.6

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.82	61.2	59.7
29.83	59.0	56.8
29.82	56.6	54.3
30.00	52.3	49.0
29.97	48.0	45.5
30.09	59.9	61.1
30.10	62.8	63.4

For summary of the elements of reduction see page 3.

24, 44. Three bisections.
1. Four bisections.

ZENITH-POINT CORR.

No. 1 to 16	+ 56.″01
No. 20 to 43	+ 55.11
No. 44 to 50	+ 51.97

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
24	−48 33.8	+ 15 38.8	. .	− 32 55.0

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
May 25	1	α Ceti	9	56 1.50	− 0.49	− **9.60**	35 11 52.90	+ 4 35.00	+ 40 1	2 55 51.42	+ 0.02	86 23 29.2	c
E. 27	2	Polaris	4	12 33.88	+32.41	− 9.90	310 10 . .	. .	. .	1 12 56.39	+ 0.76	. . . .	.
	3	β Arietis	.	. .	. .	. .	18 35 45.58	+ 5 5.61	+ 19.3	. . . .	. .	69 47 31.7	− c
	4	α Arietis	9	0 25.03	− 0.24	− **9.82**	15 55 51.90	+ 4 38.68	+ 16.4	2 0 14.97	+ 0.01	67 7 8.2	+ 1
	5	α Ceti	9	56 1.86	− 0.50	− **9.91**	35 11 55.00	+ 4 34.81	+ 40.1	2 55 51.54	+ 0.10	86 23 31.1	+ 2
28	6	Sun, N.	.	. .	. .	. .	16 59 52.72	+ 3 59.59	+ 17.3	. . . .	. .	68 10 30.8	.
	7	Sun, S.	.	. .	. .	. .	17 31 51.22	+ 3 36.79	+ 17.8	. . . .	. .	68 42 7.0	.
	8	μ Geminorum	9	15 41.73	− 0 31	− **9.64**	16 13 46.88	+ 5 1.26	+ 16.4	6 15 31.74	− 0.06	67 25 25 7	+ 3
	9	α Canis Majoris	9	39 54.24	− 0.76	− **9 68**	55 19 53.32	+ 5 23.54	+ 1 20.9	6 39 43.85	+ 0.08	106 32 59.0	+ 1
	10	ε Canis Majoris	9	53 58.28	− 0.90	− 9.64	67 35 49.55	+ 3 59.54	+ 2 14.7	6 53 47.74	+ 0.24	118 48 25.0	+ 1
	11	12² Can. Venat.	9	50 28.84	+ 0.12	− **9.74**	359 49 44.32	+ 5 0.64	− 0.1	12 50 19.15	− 0.02	51 1 6.1	+ 1
	12	θ Virginis	9	3 47.67	− 0.55	− **9.79**	43 41 48.42	+ 4 9.11	+ 54.7	13 3 37.33	− 0.04	94 53 13.4	+ 2
	13	Polaris, s. p.	7	13 41.16	−34.50	− 9.78	307 29 44.58	+ 4 19.25	− 14.2	1 12 56.88	+ 0.84	358 39 10.8	+ 2
	14	α Virginis	9	18 55.76	− 0.63	− **9.80**	49 19 52.72	+ 4 7.20	+ 1 6.7	13 18 45.35	− 0.01	100 31 27.8	+ 2
	15	ζ Virginis	9	28 38.43	− 0.50	− **9 82**	38 45 49.72	+ 5 18.86	+ 46.1	13 28 28.15	+ 0.03	89 58 15.9	+ 2
	16	B. A. C. 4553	9	32 24.76	− 0.18	− 9.78	15 39 49.20	+ 4 20.34	+ 16.1	13 22 14.80	− 2.72	66 50 46.8	− 9
	17	Durch. 25°, 2658	9	34 12.04	− 0.16	− 9.77	13 39 47.48	+ 4 37.43	+ 14.0	13 34 2.11	− 2.75	64 51 0.1	− 9
	18	η Ursæ Maj. (R.)	.	. .	. .	. .	190 57 45.38	+ 4 0.51	+ 11.3	. . . .	. .	40 4 24.0	− 0
	19	η Ursæ Majoris	3	42 54.26	+ 0.38	− 9 77	348 53 48.12	+ 4 28.46	− 11.3	13 42 44.87	− 0.06	40 4 26.5	+ 2
	20	η Bootis	9	49 2.46	− 0.26	− **9.78**	19 47 50.72	+ 4 46.86	+ 20.7	13 48 52.44	− 0.02	70 59 19.5	+ 3
	21	β Libræ	9	10 36.78	− 0.64	− **9.85**	47 43 49.72	+ 4 44.21	+ 1 3.4	15 10 26.44	+ 0.15	98 55 58.5	+ 2
	22	μ¹ Bootis	9	20 3.39	+ 0.05	− **9.71**	0 59 46.45	+ 5 29.66	+ 1.1	15 19 53.75	− 0.02	52 11 38.4	+ 1
	23	Cor. Bor.	9	29 41.52	− 0 20	− **9.52**	11 41 45.15	+ 4 7.81	+ 12.0	15 29 31.64	− 0.15	62 52 26.2	+ 1
	24	α Serpentis	9	38 25.62	− 0.47	− **9.63**	31 59 50.20	+ 4 39.56	+ 36.1	15 38 15.47	− 0.02	83 11 27.1	+ 3
	25	ε Serpentis	9	44 54.22	− 0.50	− **9.67**	33 57 49.80	+ 4 29.70	+ 38.9	15 44 44.04	− 0.02	85 9 19.6	+ 2
	26	Hebe	9	56 2.61	− 0.52	− 9.68	35 59 50.18	+ 7 12.77	+ 42.1	15 55 52.41	. .	87 14 6.3	− 2
	27	B. A. C. 5355¹	6	1 56.18	− 0.97	− 9.68	71 5 49.45	+ 4 31.37	+ 2 47.5	16 1 45.53	− 3.42	122 19 30.5	−16
	28	B. A. C. 5355²	5	1 56.73	− 0.97	− 9.68	71 5 49.45	+ 4 30.43	+ 2 47.5	16 1 46.08	− 3.42	122 19 28.6	−16
	29	B. A. C. 5437 (R.)	.	. .	. .	. .	136 39 49.92	+ 3 43.11	− 54.3	. . . .	. .	94 23 42.5	−15
	30	B. A. C. 5437	.	. .	. .	. .	43 11 45.40	+ 4 43.38	+ 54.3	. . . .	. .	94 23 44.3	−15
	31	Parthenope	9	21 26.30	− 0 73	− 9.68	53 15 46.95	+ 7 19.94	+ 1 17.6	16 21 15.89	. .	104 30 45.7	− 5.
	32	Juno	9	48 21.07	− 0.63	− 9.68	42 45 48.55	+ 6 47.77	+ 53.6	16 48 10.76	. .	93 59 51.1	− 2.
	33	α Ophiuchi	9	29 26.50	− 0.45	− **9.70**	26 9 49.20	+ 4 33.45	+ 28.5	17 29 16 36	+ 0.05	77 21 12.3	+ 3.
	34	Elpis	8	37 10.14	− 0.71	− 9.69	48 57 52.20	+ 6 30.20	+ 1 7.0	17 36 59.74	. .	100 11 50.6	− 3.
	35	μ Herculis	9	41 51.28	− 0.24	− **9.57**	11 2 . .	. .	. .	17 41 41.35	− 0.08	. . . .	.
	36	B. A. C. 6072	9	51 5.17	− 0.95	− 9.69	67 29 50.70	+ 6 12.73	+ 2 19.5	17 50 54.53	− 3.46	118 44 41.1	− 8.
	37	γ² Sagittarii	9	58 8.69	− 0.97	− **9.80**	69 11 49.52	+ 4 49.96	+ 2 31.7	17 57 58.03	+ 0.10	120 25 32.4	+ 0.
	38	Jupiter I, S.	6	6 6.13	− 0.87	− 9.69	61 53 50.52	+ 5 11.33	+ 1 48.3	18 5 55.57	+ 1.78	113 7 11.3	−25.
	39	Jupiter II, N.	5	6 9.70	− 0.87	− 9.69	61 53 50.52	+ 4 24.92	+ 1 48.2	18 5 59.14	− 1.79	113 6 24.8	+21.
	40	Moon II, S.	9	13 34.94	− 0.95	− 9.69	67 47 54.00	+ 3 10.74	+ 2 21.2	18 13 24.30	−70.95	118 59 47.1	.
P. 29	41	η Virginis	9	13 49.34	− 0.59	− **9.78**	38 48 . .	. .	. .	12 13 38.99	+ 0.01	. . . .	.
	42	B. A. C. 4165	5	14 40 30	+29.59	− 9.76	310 28 . .	. .	. .	12 15 0.13	−37.81	. . . .	.
	43	β Corvi	9	28 8.53	− 0.89	− **9.82**	61 30 . .	. .	. .	12 27 57.88	+ 0.07	. . . .	.
	44	12² Canum Venat.	9	50 28 86	+ 0.01	− **9.68**	359 50 . .	. .	. .	12 50 19.11	− 0.05	. . . .	.
	45	B. A. C. 262, s. p.	5	52 23.29	−11.57	− 9.76	304 26 . .	. .	. .	0 52 1.96	+12.51	. . . .	.
	46	θ Virginis	9	3 47.82	− 0.66	− **9.83**	43 42 . .	. .	. .	13 3 37.40	+ 0.03	. . . .	.
	47	Polaris, s. p.	9	13 42.16	−35.95	− 9.76	307 30 . .	. .	. .	1 12 56.45	− 0.41	. . . .	.
	48	α Virginis	9	18 55.79	− 0.74	− **9 72**	49 20 . .	. .	. .	13 18 45.29	− 0.07	. . . .	.
	49	ζ Virginis	9	28 38.49	− 0.60	− **9.78**	38 46 . .	. .	. .	13 28 28.14	+ 0.02	. . . .	.
	50	B. A. C. 4643	7	46 10.73	+ 5.84	− 9.75	315 28 . .	. .	. .	13 46 6.82	−11.43	. . . .	.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.10	64.8	65.2
2	30.35	64.2	65.0
7	30.35	70.9	73.5
10	30.33	76.5	77.0
11	30.29	66.5	64.8
40	30.29	59.0	58.0

For summary of the elements of reduction see page 3.

13. Three bisections.
40. Five bisections.

ZENITH-POINT CORR.

No. 1 + 51.97″
No. 3 to 10 + 50.63
No. 11 to 40 + 52.03

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
6	− 2.5	+ 15 48.1	. .	+ 15 45.6
7	− 2.6	− 15 48.1	. .	− 15 50.7
38	− 1.8	− 23.2	. .	− 25.0
39	− 1.8	+ 23.3	. .	+ 21.5
40	− 51 0.3	− 15 4.2	. .	− 66 4.

E) R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
7.				m. s.	s.	s.	' '	' '	' "	h. m. s.	s.	° ' "	"
29	1	η Bootis	9	49 2.46	− 0.35	− **9.69**	19 48 . .	. . .	. .	13 48 52.36	− 0.10	. . . .	. .
31	2	12^2 Canum Venat.	9	50 28.94	0.00	− **9.78**	359 49 47.00	+ 4 57.05	− 0.1	12 50 19.07	− 0.06	51 1 5.1	+ 1.1
	3	θ Virginis	9	3 47.84	− 0.58	− **9.95**	43 41 55.40	+ 4 2.44	+ 53.5	13 3 37.38	+ 0.03	94 53 12.5	+ 2.0
	4	Polaris, s.p.	9	13 40.48	−32.03	− 9.88	307 29 56.18	+ 4 4.76	− 1 12.6	1 12 58.57	+ 0.21	358 39 9.5	+ 1.1
	5	α Virginis	9	18 55.90	− 0.64	− **9.94**	49 19 58.10	+ 4 1.20	+ 1 5.2	13 18 45.38	+ 0.03	100 31 25.7	+ 0.8
	6	ζ Virginis	9	28 38.56	− 0.53	− **9.93**	38 45 57.20	+ 5 11.56	+ 45.1	13 28 28.14	+ 0.03	89 58 15.1	+ 1.7
	7	η Bootis	9	49 2.54	− 0.31	− **9.82**	19 47 55.75	+ 4 10.59	+ 20.3	13 45 52.33	− 0.12	70 59 17.8	+ 1.9
	8	ε^2 Bootis	9	39 49.01	− 0.20	− **9.87**	11 13 53.78	+ 4 7.73	+ 11.3	14 39 39.81	− 0.05	62 24 34.0	+ 1.3
	9	α^2 Libræ	9	44 18.16	− 0.71	− **10.03**	54 19 56.52	+ 4 28.44	+ 1 18.6	14 44 7.52	+ 0.10	105 32 4.8	+ 1.1
	10	β Bootis	9	57 31.81	+ 0.05	− **9.94**	357 55 54.20	+ 5 19.81	− 2.0	14 57 21.92	+ 0.03	49 7 33.2	− 0.1
	11	β Libræ	9	10 36.96	− 0.64	− **10.02**	47 43 56.28	+ 4 36.79	+ 1 2.3	15 10 26.38	+ 0.08	98 55 56.6	+ 0.9
	12	μ^1 Bootis	9	20 3.50	− 0.01	− **9.85**	0 59 55.98	+ 5 18.36	+ 1.1	15 19 53.64	− 0.13	52 11 36.6	+ 0.9
	13	α Cor. Borealis	9	29 41.93	− 0.20	− **9.92**	11 41 55.02	+ 3 58.08	+ 11.8	15 29 31.79	− 0.01	62 52 26.1	+ 2.0
	14	Juno	9	45 49.68	− 0.58	− 9.96	42 39 58.18	+ 5 7.94	+ 52.5	16 45 39.14	. .	93 52 19.8	− 2.6
	15	XVII, 10	9	30 9.93	− 0.91	− 9.97	69 35 56.30	+ 5 11.90	+ 2 32.5	17 29 59.05	− 3.59	120 50 1.9	− 9.8
	16	Elpis	9	34 47.33	− 0.65	− 9.97	48 51 56.88	+ 5 44.95	+ 1 5.4	17 34 36.71	. .	100 5 8.4	− 3.6
	17	γ Draconis (R.)	.	. . . .	. .	. .	192 31 53.75	+ 4 15.09	+ 12.8	. . . . .	. .	38 29 59.6	− 0.3
	18	γ Draconis	3	58 57.46	− 0.33	− 9.98	347 19 57.32	+ 3 54.58	− 12.8	17 53 47.15	− 0.86	38 30 0.3	+ 0.2
	19	δ Ursæ Minoris	8	12 9.44	+11.65	− 9.98	312 13 54.30	+ 4 32.19	− 1 2.5	18 12 11.11	+ 0.29	3 23 45.2	+ 0.2
	20	Anonymous	9	29 48.06	− 0.86	− 9.98	66 9 58.38	+ 4 59.37	+ 2 9.0	18 29 37.22	− 3.44	117 23 28.0	− 4.9
	21	α Lyræ	9	32 59.00	− 0.01	− **9.94**	0 9 55.50	+ 3 43.65	+ 0.9	18 32 49.01	− 0.01	51 20 1.3	+ 0.4
	22	51 Cephei, s.p.	9	42 35.20	−15.66	− 9.99	306 3 56.50	+ 5 13.78	− 1 18.0	6 42 9.55	+ 0.97	357 14 13.5	+ 1.2
	23	ζ Aquilæ (R.)	.	. . . .	. .	. .	154 43 57.20	+ 3 34.91	− 26.9	. . . . .	. .	76 19 16.0	+ 2.2
	24	ζ Aquilæ	.	. . . .	. .	. .	25 7 55.60	+ 4 32.03	+ 26.9	. . . . .	. .	76 19 15.7	+ 1.9
	25	δ Aquilæ	9	19 31.00	− 0.51	− **10.00**	35 55 58.10	+ 4 50.92	+ 41.6	19 19 20.50	+ 0.08	87 7 51.8	+ 1.5
	26	γ Aquilæ	9	40 37.68	− 0.42	− **10.02**	28 29 59.12	+ 3 23.24	+ 31.2	19 40 27.26	+ 0.05	70 40 14.8	+ 1.2
	27	α Aquilæ	9	44 59.91	− 0.44	− **10.02**	30 15 57.15	+ 4 33.33	+ 33.5	19 44 49.47	+ 0.06	81 27 25.2	+ 0.2
	28	λ Ursæ Minoris	5	46 54.82	+38.78	− 10.00	309 53 57.08	+ 4 58.55	− 1 8.2	19 47 23.60	+ 1.85	1 4 8.6	+ 1.4
	29	B.A.C. 2677, s.p.	5	0 51.37	− 6.34	− 10.00	301 39 59.02	+ 3 51.97	− 1 32.4	8 0 35.03	− 1.45	352 48 39.8	−16.0
	30	B.A.C. 2077	8	25 46.71	− 0.84	− 10.01	64 11 57.85	+ 1 5.64	+ 1 58.1	20 25 35.86	− 2.96	115 21 22.8	+ 4.6
	31	α Cygni	9	37 26.03	+ 0.15	− **10.01**	353 57 59.40	+ 5 29.60	− 6.0	20 37 16.17	+ 0.04	45 9 44.2	+ 0.6
	32	γ^1 Delphini	6	41 8.82	− 0.36	− 10.01	23 7 56.88	+ 4 27.97	+ 24.6	20 40 58.45	− 2.15	74 19 10.6	− 6.3
	33	γ^2 Delphini	5	41 9.60	− 0.36	− 10.01	23 7 56.88	+ 4 28.77	+ 24.6	20 40 59.23	− 2.15	74 19 11.4	− 6.3
	34	Moon II, N.	5	54 16.30	− 0.78	− 10.02	59 6 0.12	+ 3 52.72	+ 1 35.9	20 54 5.50	−65.25	110 17 49.9	. .
	35	β Arietis	9	48 1.72	− 0.34	− **9.92**	18 35 55.62	+ 4 56.77	+ 19.0	1 47 51.50	+ 0.06	69 47 32.6	+ 0.9
	36	α Arietis	9	0 25.23	− 0.30	− **9.85**	15 55 56.58	+ 4 33.45	+ 16.1	2 0 15.04	− 0.03	67 7 7.3	+ 1.3
1	37	Sun I, S.	9	37 45.64	− 0.26	− 9.89	16 55 56.38	+ 4 43.91	+ 16.9	4 37 35.49	+68.37	68 7 18.4	. .
	38	Sun II, N.	9	40 2.38	− 0.26	− 9.89	16 23 55.62	+ 5 9.47	+ 16.3	4 39 52.23	−68.37	67 35 42.6	. .
	39	α^2 Geminorum	9	26 55.98	− 0.10	− **9.90**	6 39 52.60	+ 4 11.19	+ 6.4	7 26 45.98	+ 0.30	57 50 31.4	+ 2.2
	40	α Canis Minoris	9	33 2.83	− 0.49	− **9.90**	33 15 52.15	+ 4 51.47	+ 35.9	7 32 52.44	− 0.10	84 27 40.7	+ 1.0
	41	θ Virginis	9	3 47.76	− 0.66	− **9.79**	43 41 53.55	+ 4 4.85	+ 53.5	13 3 37.30	− 0.05	94 53 13.1	+ 2.6
	42	Polaris, s.p.	6	13 42.75	−34.28	− 9.80	307 29 53.18	+ 4 8.49	− 1 12.6	1 12 58.67	− 0.39	358 39 10.3	+ 2.1
	43	α Virginis	9	18 55.90	− 0.73	− **9.85**	49 19 55.15	+ 4 5.47	+ 1 5.2	13 18 45.37	+ 0.02	100 31 27.0	+ 2.2
	44	ζ Virginis	9	28 38.47	− 0.60	− **9.77**	38 45 50.88	+ 5 18.40	+ 45.1	13 28 28.06	+ 0.05	89 58 15.6	+ 2.3
	45	B. A. C. 4568 (R.)	.	. . . .	. .	. .	196 19 52.60	+ 4 27.11	+ 16.5	. . . .	. .	34 41 45.0	− 2.0
	46	B. A. C. 4568	6	36 17.21	+ 0.46	− 9.81	343 31 47.55	+ 3 55.06	− 16.5	13 36 7.86	− 3.50	34 41 47.3	− 2.0
	47	B. A. C. 4629^1	6	46 21.43	− 0.99	− 9.81	70 5 52.98	+ 5 0.43	+ 2 34.1	13 46 10.63	− 2.66	121 19 48.7	−23.1
	48	B. A. C. 4629^2	5	46 21.58	− 0.99	− 9.81	70 5 52.98	+ 4 44.75	+ 2 34.0	13 46 10.78	− 2.66	121 19 32.9	−23.1
	49	η Bootis	9	49 2.58	− 0.36	− **9.81**	19 47 48.05	+ 4 48.25	+ 20.4	13 48 52.41	− 0.04	70 59 17.9	+ 2.0
	50	B. A. C. 5054	9	14 14 53	− 1.07	− 9.83	74 33 49.40	+ 5 36.47	+ 3 22.1	15 14 3.63	− 3.32	125 49 9.2	−20.2

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.12	74.0	73.5
30.13	72.0	71.0
30.13	67.3	66.8
30.12	65.3	63.3
30.12	63.3	62.0
30.11	61.3	60.2
30.13	60.2	59.5
30.22	69.0	71.0
30.24	70.0	82.5
30.23	87.5	87.5
30.18	74.5	73.5

For summary of the elements of reduction see page 3.

12. One bisection.
4, 19, 22, 29, 34, 42. Three bisections.

ZENITH-POINT CORR.

	"
No. 2 to 34	+ 50.27
No. 35 to 40	+ 48.91
No. 41 to 50	+ 50.45

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
34	−46 26.5	+ 14 48.8	. .	− 31 37.7
37	− 2.5	− 15 47.9	. .	− 15 50.4
38	− 2.5	+ 15 47.9	. .	+ 15 45.4

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
June 1	1	B. A. C. 5069 .	9	17 36.32	− 1.11	− 9.83	77 3 53.80	+ 3 51.59	+ 4 1.3	15 17 25.38	− 3.40	128 18 7.9	−2
E.	2	B. A. C. 5092 .	9	21 21.61	+ 0.17	− 9.83	351 19 53.32	+ 4 22.19	− 8.5	15 21 11.95	− 3.27	42 30 28.2	−
	3	B. A. C. 5135¹ .	6	29 8.75	− 0.48	− 9.83	27 51 51.75	+ 4 31.47	+ 29.9	15 28 58.44	− 2.90	79 3 14.3	−14
	4	B. A. C. 5135² .	5	29 8.83	− 0.48	− 9.83	27 51 51.75	+ 4 28.54	+ 29.9	15 28 58.52	− 2.90	79 3 11.4	−14
	5	α Serpentis (R.) .	.	. . .	. .	. .	147 51 47.22	+ 3 44.01	− 35.4	. . . .	. .	83 11 25.4	+ 1
	6	α Serpentis . .	.	. . .	. .	. .	31 59 55.20	+ 4 34.32	+ 35.4	. . . .	. .	83 11 26.1	+ 2
	7	O. Arg. N. 15653	8	43 51.48	+ 0.46	− 9.83	343 1 51.82	+ 1 6.82	− 17.2	15 43 42.11	− 3.52	34 9 2.6	− 9
	8	O. Arg. N. 15662	7	44 28.23	+ 0.46	− 9.83	343 1 51.82	+ 6 1.81	− 17.1	15 44 18.86	− 3.52	34 13 57.7	− 9
	9	B. A. C. 5248 .	8	44 52.76	+ 0.46	− 9.83	343 1 51.82	+ 7 0.63	− 17.1	15 44 43.39	− 3.51	34 11 56.5	− 9
	10	Hebe. . . .	9	52 20.76	− 0.58	− 9.83	35 59 54.48	+ 6 6.92	+ 41.2	15 52 10.35	. .	87 13 3.8	− 2
	11	B. A. C. 5355¹ .	6	1 56.33	− 1.03	− 9.84	71 6 . .	. . .	. .	16 1 45.46	− 3.46	. . . .	.
	12	B. A. C. 5355² .	5	1 57.03	− 1.03	− 9.84	71 6 . .	. . .	. .	16 1 46.16	− 3.45	. . . .	.
	13	B. A. C. 5395	9	6 40.69	− 0.87	− 9.84	59 51 51.95	+ 5 29.26	+ 1 37.4	16 6 29.98	− 3.24	111 5 19.8	−16
	14	B. A. C. 5435¹ .	9	11 59.16	− 1.00	− 9.84	69 23 53.00	+ 3 38.37	+ 2 29.6	16 11 48.32	− 3.45	120 36 22.2	−16
	15	B. A. C. 5435² .	9	12 0.27	− 1.00	− 9.84	69 23 53.00	+ 3 56.23	+ 2 29.7	16 11 49.43	− 3.45	120 36 40.1	−16.
	16	Parthenope . .	9	17 31.81	− 0.79	− 9.84	53 11 50.95	+ 6 54.28	+ 1 15.8	16 17 21.18	. .	104 26 22.2	− 5.
	17	α Scorpii . . .	9	22 6.21	− 0.94	− **9.82**	64 55 52.28	+ 5 28.10	+ 2 0.8	16 21 55.43	− 0.04	116 9 42.4	+ 2.
	18	ζ Ophiuchi . .	9	30 36.91	− 0.74	− **9.84**	49 7 54.08	+ 3 53.66	+ 1 5.5	16 30 26.33	0.00	100 19 14.4	+ 3.
	19	B. A. C. 5583 .	6	35 28.65	− 1.17	− 9.84	79 37 50.05	+ 4 1.66	+ 5 1.1	16 35 17.64	− 3.87	130 53 14.0	−14.
	20	B. A. C. 5584 .	8	35 36.95	− 1.17	− 9.84	79 37 50.05	+ 3 42.91	+ 5 0.9	16 35 25.94	− 3.87	130 52 55.1	−14.
	21	Juno	9	41 59.04	− 0.66	− 9.84	42 35 53.10	+ 6 58.05	+ 52.3	16 44 48.54	. .	93 50 4.7	− 2.
	22	κ Ophiuchi . .	9	52 4.13	− 0.51	− **9.87**	29 13 50.22	+ 5 28.57	+ 31.8	16 51 53.77	+ 0.09	80 26 11.8	+ 3.
P. 7	23	β Ursæ Min., S. P.	9	51 21.26	− 2.23	− 8.60	293 29 57.10	+ 5 18.13	− 2 6.5	14 51 10.43	+ 0.11	344 39 29.9	+ 4.
	24	α Ceti	9	56 0.50	− 0.22	. .	35 11 55.22	+ 4 30.10	+ 39.3	. . . .	. .	86 23 25.8	− 1.
	25	α Persei . . .	8	15 41.23	+ 0.27	− 8.60	349 23 55.92	+ 4 30.40	− 10.3	3 15 32.90	− 0.16	40 34 37.2	− 1.
8	26	Sun I, N. . .	3	6 32.71	− 0.05	− 8.60	15 37 49.88	+ 5 17.28	+ 15.4	5 6 24.06	+68.58	66 49 43.8	.
	27	Sun II, S. . .	9	8 49.88	− 0.05	− 8.60	16 9 58.20	+ 4 38.02	+ 16.0	5 8 41.23	−68.59	67 21 13.4	.
S. 11	28	Polaris, S. P. .	4	13 42.25	−27.07	− 7.78	307 29 55.38	+ 4 7.24	− 1 13.5	1 13 7.40	− 0.38	358 39 10.3	+ 3.
	29	η Bootis . . .	9	49 0.46	− 0.30	− **7.81**	19 47 53.90	+ 4 41.05	+ 20.5	13 48 52.38	− 0.01	70 59 17.3	+ 2.
	30	α Bootis . . .	9	10 13.86	− 0.30	− **7.77**	18 59 56.58	+ 4 10.00	+ 19.6	14 10 5.78	+ 0.01	70 10 47.4	+ 2.
	31	ι Cassiopeæ, S. P.	9	19 6.86	− 2.06	− 7.78	285 43 55.78	+ 3 55.87	− 3 18.1	2 18 57.02	+ 0.52	336 50 54.7	+ 3.
	32	ε Bootis . . .	9	39 47.74	− 0.22	− **7.69**	11 3 56.38	+ 4 3.49	+ 11.4	14 39 39.74	− 0.08	62 24 32.5	+ 1.
	33	α² Libræ . . .	9	44 15.98	− 0.65	− **7.90**	54 19 58.95	+ 4 25.97	+ 1 19.4	14 44 7.55	+ 0.12	105 32 5.5	+ 1.
	34	β Bootis . . .	9	57 29.60	− 0.02	− **7.72**	357 55 54.22	+ 5 17.63	− 1.9	14 57 21.80	− 0.03	49 7 31.1	+ 0.
	35	B. A. C. 5348 (R.)	.	. . .	. .	. .	199 55 55.08	+ 3 38.74	+ 20.8	. . . .	. .	31 6 26.6	− 6.
	36	B. A. C. 5348 .	.	. . .	. .	. .	339 55 58.65	+ 4 30.28	− 20.8	. . . .	. .	31 6 29.3	− 6.
E 12	37	η Tauri . . .	9	40 19.22	− 0.29	− **7.80**	15 5 55.42	+ 3 55.74	+ 15.0	3 40 11.12	0.00	66 16 27.4	− 0.
	38	ζ Persei . . .	9	46 32.78	− 0.18	− **7.81**	7 17 57.28	+ 4 28.50	+ 7.2	3 46 24.79	+ 0.02	58 28 54.2	+ 1.
	39	γ¹ Eridani . .	9	52 26.48	− 0.73	− **7.83**	52 39 58.28	+ 3 49.56	+ 1 12.6	3 52 17.91	+ 0.05	103 51 21.6	+ 1.
13	40	Sun I, N. . .	9	27 15.42	− 0.27	− 7.81	15 17 56.78	+ 4 19.60	+ 15.2	5 27 7.31	+68.90	66 28 52.8	.
	41	Venus I, S. . .	9	12 50.19	− 0.27	− 7.81	14 37 50.32	+ 4 43.57	+ 14.5	6 12 42.11	+ 0.37	65 49 9.6	.
	42	Venus N. . .	.	. . .	. .	. .	14 37 50.32	+ 4 32.82	+ 14.5	. . . .	. .	65 48 58.8	.
F. 14	43	B. A. C. 5435¹ .	6	11 56.60	− 0.40	− 7.46	69 23 53.82	+ 3 40.14	+ 2 28.5	16 11 48.74	− 3.56	120 36 23.7	−16.
	44	B. A. C. 5435² .	5	11 57.71	− 0.40	− 7.46	69 23 53.82	+ 3 56.91	+ 2 28.6	16 11 49.85	− 3.56	120 36 40.5	−16.
	45	α Scorpii . . .	9	22 3.53	− 0.38	− **7.58**	64 55 52.35	+ 5 29.49	+ 1 59.9	16 21 55.69	+ 0.10	116 9 42.9	+ 1.
	46	Juno	9	34 7.80	− 0.28	− 7.46	42 19 50.82	+ 5 19.19	+ 51.3	16 34 0.06	. .	93 32 22.5	− 2.
	47	η Herculis. . .	9	38 51.27	− 0.02	− **7.42**	359 39 46.40	+ 4 36.70	− 0.3	16 38 43 79	− 0.04	50 50 44.0	+ 2.
	48	κ Ophiuchi (R.) .	.	. . .	. .	. .	150 35 49.25	+ 4 55.93	− 31.5	. . . .	. .	80 26 7.5	+ 1.
	49	κ Ophiuchi . .	.	. . .	. .	. .	29 13 56.35	+ 5 20.46	+ 31.5	. . . .	. .	80 26 9.5	+ 3.
	50	B. A. C. 5781 .	9	3 30.78	− 0.34	− 7.41	54 21 54.28	+ 4 53.41	+ 1 17.9	17 3 22.98	− 3.39	105 34 26.8	−12.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
22	30.18	69.0	66.8
23	30.03	74.0	74.5
27	30.03	79.3	81.1
28	30.13	67.8	66.2
33	30.15	65.8	64.0
37	30.03	75.0	76.5
40	30.28	78.6	80.4
43	30.21	74.0	72.4
50	30.21	73.5	71.8

For summary of the elements of reduction see page 3.

9, 45. One bisection.
28. Three bisections.
17, 29. Four bisections.

ZENITH-POINT CORR.

	″
No. 1 to 22	+ 50.45
No. 23 to 27	+ 50.49
No. 28 to 36	+ 52.15
No. 37 to 42	+ 50.27
No. 43 to 50	+ 52.15

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	− 2.3	+ 15 44.8	. .	+ 15 42.5
27	− 2.4	− 15 44.8	. .	− 15 47.2
40	− 2.3	+ 15 46.9	. .	+ 15 44.6
41	− 1.3	− 5.4	. .	− 6.7
42	− 1.3	+ 5.4	− 0.0	+ 4.1

ATE ND S'R.	Number.	OBJECT.	Threads.	* MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.		s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
ne 14	1	α¹ Herculis . .	9	9 12.98	− 0.20	− **7.37**	24 15 48.15	+ 5 41.97	+ 25.4	17 9 5.33	− 0.06	75 28 16.7	+ 2.4
F.	2	Elpis . . .	9	22 41.48	− 0.31	− 7.45	48 31 52.30	+ 6 28.28	+ 1 3.8	17 22 33.72	. .	99 45 45.6	− 3.6
	3	δ Ursæ Minoris .	5	12 12.90	+ 5.88	− 7.45	312 13 46.32	+ 4 35.56	− 1 1.8	18 12 11.33	+ 0.08	3 23 41.3	+ 0.8
	4	ι Aquilæ . . .	9	28 41.93	− 0.31	− **7.51**	47 8 0.25	+ 4 26.70	− 1 0.8	18 28 34.17	+ 0.14	98 19 49.0	+ 1.5
	5	51 Cephei, S. P. .	5	42 23.48	− 8.03	− 7.45	306 3 51.60	+ 5 14.39	− 1 16.9	6 42 8.00	+ 0.33	357 14 10.3	+ 2.3
	6	β Lyræ	9	45 42.61	− 0.08	− **7.38**	5 35 53.48	+ 4 34.16	+ 5.6	18 45 35.08	− 0.03	56 46 54.4	+ 0.8
	7	50 Draconis . .	5	50 30.02	+ 1.04	− 7.45	323 31 46.98	+ 5 29.67	− 41.5	18 50 23.61	+ 0.24	14 42 56.3	+ 0.3
	8	ζ Aquilæ . . .	9	59 55.99	− 0.21	− **7.45**	25 7 42.58	+ 4 41.27	+ 26.5	18 59 48.33	+ 0.11	76 19 11.5	+ 0.8
	9	B. A. C. 2326, S. P.	4	5 15.40	− 3.25	− 7.45	301 29 49.45	+ 4 5.10	− 1 31.4	7 5 4.70	+ 1.08	352 38 44.4	−11.5
	10	δ Draconis (R.) .	.	. . .	. .	. .	208 27 55.72	+ 4 26.45	+ 30.6	. . . .	. .	22 33 28.4	− 1.1
	11	δ Draconis . .	.	. . .	. .	. .	331 23 50.45	+ 3 51.02	− 30.6	. . . .	. .	22 33 32.1	+ 2.6
. 18	12	α Ceti	9	55 58.29	+ 0.15	− **6.48**	35 11 50.30	+ 4 36.59	+ 39.0	2 55 51.93	− 0.02	86 23 27.1	+ 1.7
	13	α Persei . . .	9	15 39.82	+ 0.14	− 6.50	319 23 50.30	+ 4 37.96	− 10.2	3 15 33.46	+ 0.02	40 34 39.3	+ 0.4
	14	ζ Persei . . .	9	46 31.24	+ 0.13	− **6.43**	7 17 50.32	+ 4 33.55	+ 7.1	3 46 24.89	− 0.03	58 28 52.2	− 0.6
	15	γ¹ Eridani . . .	9	52 24.42	+ 0.19	− **6.57**	52 39 53.62	+ 3 54.54	+ 1 11.8	3 52 18.13	+ 0.12	103 51 21.2	+ 2.8
	16	Mercury II, S. .	9	19 42.26	+ 0.14	− 6.47	20 59 51.42	+ 4 27.08	+ 21.2	4 19 35.93	− 0.28	72 11 0.9	. .
	17	Mercury, N.. .	.	. . .	. .	. .	20 59 51.42	+ 4 22.50	+ 21.2	. . . .	. .	72 10 56.3	. .
19	18	Sun I, N. . .	9	52 9.99	+ 0.14	− 6.41	15 5 49.00	+ 5 0.87	+ 14.7	5 52 3.72	+69.14	66 17 25.8	. .
	19	Sun II, S. . .	9	54 28.27	+ 0.14	− 6.41	15 37 48.35	+ 4 31.98	+ 15.2	5 54 22.00	−69.14	66 48 56.7	. .
	20	Venus I, S. . .	6	45 6.08	+ 0.15	− 6.38	14 47 49.30	+ 4 41.58	+ 14.4	6 44 59.85	+ 0.37	65 59 6.5	. .
	21	Venus II, N. .	5	45 6.80	+ 0.15	− 6.38	14 47 49.30	+ 4 30.91	+ 14.4	6 45 0.57	− 0.35	65 58 55.8	. .
	22	δ Geminorum . .	9	12 53.67	+ 0.15	− **6.38**	16 36 . .	. .	. .	7 12 47.45	− 0.03	. . . .	. .
	23	α Canis Minoris .	9	32 58.68	+ 0.16	− **6.40**	33 15 48.48	+ 4 55.21	+ 35.5	7 32 52.48	− 0.06	84 27 40.4	+ 1.9
	24	β Geminorum. .	6	37 54.41	+ 0.15	− **6.34**	10 29 47.52	+ 4 20.12	+ 10.8	7 37 48.21	− 0.03	61 40 39.6	+ 3.9
	25	12¹ Canum Venat. .	6	50 23.85	+ 0.03	− 6.37	359 49 46.22	+ 5 11.14	− 0.1	12 50 17.51	− 2.55	51 1 18.5	− 1.2
	26	12² Canum Venat. .	5	50 25.21	+ 0.03	− **6.35**	359 49 46.22	+ 4 56.69	− 0.1	12 50 18.87	+ 0.01	51 1 4.0	+ 2.1
	27	θ Virginis . . .	9	3 43.48	+ 0.10	− **6.39**	43 41 46.50	+ 4 12.67	+ 52.2	13 3 37.21	− 0.02	94 53 12.6	+ 3.1
	28	Moon I, N. . .	5	10 54.71	+ 0.12	− 6.37	50 55 45.92	+ 4 17.82	+ 1 7.3	13 10 48.49	+66.68	102 7 32.2	. .
	29	Polaris, S. P. .	6	13 22.17	− 1.20	− 6.37	307 29 43.60	+ 4 13.82	− 1 10.8	1 13 14.60	+ 0.01	358 39 7.8	+ 1.1
	30	ζ Virginis . . .	9	28 34.28	+ 0.09	− **6.38**	38 45 47.98	+ 5 21.80	+ 44.0	13 28 27.99	− 0.01	89 58 15.0	+ 2.9
	31	η Bootis . . .	9	48 58.36	+ 0.06	− **6.14**	19 47 46.20	+ 4 49.68	+ 19.8	13 48 52.04	− 0.28	70 59 16.9	+ 3.2
	32	B. A. C. 5348 (R.)	.	. . .	. .	. .	199 55 54.65	+ 3 42.27	+ 20.1	. . . .	. .	31 6 24.2	− 4.4
	33	B. A. C. 5348 .	.	. . .	. .	. .	339 55 55.85	+ 4 29.76	− 20.1	. . . .	. .	31 6 26.7	− 4.4
	34	B. A. C. 5466 (R.)	.	. . .	. .	. .	160 27 58.30	+ 5 8.54	− 19.6	. . . .	. .	70 33 34.0	− 9.6
	35	B. A. C. 5466 .	.	. . .	. .	. .	19 21 51.60	+ 5 0.21	+ 19.6	. . . .	. .	70 33 35.6	− 9.6
	36	Juno	6	30 15.19	+ 0.13	− 6.43	42 19 59.88	+ 4 26.67	+ 50.6	16 30 8.89	. .	93 31 38.4	− 2.5
	37	XVI, 17 . . .	9	37 28.57	+ 0.18	− 6.43	67 3 57.30	+ 4 27.43	+ 2 10.6	16 37 22.32	− 3.64	118 16 56.5	−15.0
	38	B. A. C. 5632 .	9	42 21.79	+ 0.20	− 6.43	72 49 57.75	+ 5 3.00	+ 2 58.2	16 42 15.50	− 3.84	124 4 20.2	−15.1
	39	B. A. C. 5694 .	9	49 10.62	+ 0.20	− 6.43	70 53 57.48	+ 5 35.55	+ 2 39.4	16 49 4.39	− 3.80	122 8 33.6	−14.4
	40	Elpis . . .	9	18 17.62	+ 0.16	− 6.44	48 29 56.05	+ 6 39.15	+ 1 3.0	17 18 11.34	. .	99 43 59.4	− 3.6
	41	μ Herculis . .	9	41 47.98	+ 0.13	− **6.37**	11 1 54.00	+ 4 4.37	+ 10.9	17 41 41.66	− 0.04	62 12 30.5	+ 1.0
	42	Jupiter I, N. .	6	54 31.07	+ 0.18	− 6.45	61 57 54.05	+ 3 2.67	+ 1 44.2	17 54 24.80	+ 1.76	113 9 2.7	+21.6
	43	Jupiter II, S. .	5	54 34.58	+ 0.18	− 6.45	61 57 54.65	+ 3 49.56	+ 1 44.2	17 54 28.31	− 1.75	113 9 49.6	−25.2
	44	γ² Sagittarii . .	9	58 4.62	+ 0.20	− **6.48**	69 11 55.52	+ 4 49.13	+ 2 25.7	17 57 58.37	+ 0.02	120 25 31.5	− 1.0
	45	μ¹ Sagittarii . .	9	6 31.44	+ 0.18	− **6.50**	59 53 58.20	+ 3 32.19	+ 1 35.8	18 6 28.17	+ 0.08	111 5 27.4	+ 0.3
	46	δ Ursæ Minoris .	6	12 16.62	+ 1.07	− 6.45	312 13 53.88	+ 4 24.55	− 1 0.5	18 12 11.24	− 0.05	3 23 39.1	+ 0.2
.	47	η Tauri . . .	8	40 17.82	+ 0.08	− **6.61**	15 6 . .	. .	. .	3 40 11.31	+ 0.03	. . . .	. .
	48	ζ Persei . . .	7	46 31.39	+ 0.11	− **6.54**	7 18 . .	. .	. .	3 46 24.92	− 0.03	. . . .	. .
	49	α Tauri . . .	9	28 59.12	+ 0.09	− **6.65**	22 33 58.28	+ 3 32.62	+ 23.1	4 28 52.59	+ 0.02	73 44 15.2	+ 2.9
20	50	Sun I, S. . .	9	56 20.17	+ 0.14	− 6.67	15 37 51.18	+ 3 58.76	+ 15.5	5 56 13.64	+68.88	66 48 26.6	. .

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.21	73.5	71.8
30.20	72.0	70.0
30.19	71.6	70.0
30.11	79.6	80.2
30.12	83.0	83.6
30.04	86.6	87.6
30.03	89.5	90.0
30.00	84.8	84.0
30.03	78.5	76.8
. .	. .	75.3
30.04	75.5	74.0
30.20	79.0	78.6

For summary of the elements of reduction see page 3.

3, 5. Five bisections.
7. One bisection.
9, 28. Three bisections.

ZENITH-POINT CORR.

		′ ″
No. 1 to 11	+	52.15
No. 12 to 24	+	53.94
No. 25 to 31	+	54.08
No. 32 to 46	+	1 2.21
No. 49 to 50	+	1 2.42

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
16	− 3.9	− 2.4	+ 0.2	− 6.1
17	− 3.9	+ 2.4	. .	− 1.5
18	− 2.3	+ 15 45.4	. .	+ 15 43.1
19	− 2.4	− 15 45.4	. .	− 15 47.8
20	− 1.3	− 5.4	. .	− 6.7
21	− 1.3	+ 5.4	− 0.1	+ 4.0
28	−44 43.1	+ 15 46.0	. .	− 28 57.1
42	− 1.8	+ 23.4	. .	+ 14.0
43	− 1.8	− 23.4	. .	− 17.6
50	− 2.3	− 15 44.4	. .	− 15 46.7

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				h. m.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
June 20	1	Sun II, N. . .	9	58 37.92	+ 0.14	− 6.67	15 5 54.30	+ 4 27.38	+ 14 9	5 58 31.39	−68.87	66 16 57.8	.
P.	2	Venus I, S. . .	9	50 28.46	+ 0.18	− 6.69	14 51 54.42	+ 4 43.61	+ 14 7	6 50 21.95	+ 0.37	66 3 13.9	.
	3	Venus N. . . .	.	. . .	. .	. .	14 51 54.42	+ 4 33.92	+ 14.7	. . . .	. .	66 3 4.2	.
	4	α² Geminorum. .	9	26 52.60	+ 0.22	− **6.82**	6 39 54.38	+ 4 9.28	+ 6.6	7 26 46.11	+ 0.41	57 50 31.5	+ 1
	5	α Canis Minoris .	9	32 58.98	+ 0.12	− **6.65**	33 15 55.85	+ 4 45.77	+ 36.1	7 32 52.38	− 0.17	84 27 38.9	+ 0
	6	β Geminorum. .	9	37 54.71	+ 0.20	− **6.68**	10 29 50.38	+ 4 15 67	+ 10.2	7 37 48 19	− 0.06	61 40 37.4	+ 1
	7	B. A. C. 4686 .	9	59 36.28	0.00	− 6.68	74 32 . .	. . .	. .	13 59 29.60	− 2.70	. . . .	.
	8	Moon I, N. . .	9	2 49.36	+ 0.03	− 6.68	56 35 57.82	+ 6 6.66	+ 1 24.7	14 2 42.71	+67.78	107 49 50.4	.
	9	α Bootis . . .	9	10 12.27	+ 0.13	− **6.67**	19 0 . .	. . .	. .	14 10 5.72	+ 0.01	. . . .	.
	10	θ Bootis . . .	9	21 10.16	+ 0.33	− 6.68	346 24 . .	. . .	. .	14 21 3.81	+ 0.18	. . . .	.
	11	5 Ursæ Minoris .	9	27 59.23	+ 1.04	− 6.68	322 35 56.65	+ 3 50.45	− 42.6	14 27 53.59	+ 0.20	13 45 25.7	− 0
	12	ε Bootis . . .	9	39 46.31	+ 0.16	− **6 71**	11 14 . .	. . .	. .	14 39 39.79	+ 0.04	. . . .	.
	13	β Bootis . . .	8	57 28.19	+ 0.23	− **6.65**	357 56 . .	. . .	. .	14 57 21.74	0.00	. . . .	.
	14	α Serpentis . .	9	38 22.21	+ 0.08	− **6.70**	31 59 57.15	+ 4 29.47	+ 35.9	15 38 15.61	+ 0.05	83 11 23.7	+ 2.
	15	ε Serpentis . .	9	44 50.73	+ 0.07	− **6.66**	33 58 1.90	+ 4 13.78	+ 37.8	15 44 44.12	− 0.03	85 9 14.7	+ 0.
	16	ζ Ursæ Minoris .	9	48 40.51	+ 1.17	− 6.68	320 39 53.68	+ 4 15.69	− 45.7	15 48 25.00	+ 0.09	11 49 44.9	+ 1
F. 22	17	α Serpentis . .	9	38 22.46	− 0.24	− **6.63**	32 0 0.78	+ 4 22.93	+ 35 5	15 38 15.57	+ 0.01	83 11 20.4	− 0.
	18	ε Serpentis . .	9	44 51.03	− 0.26	− **6 63**	33 57 58.48	+ 4 14.98	+ 38.3	15 44 44.12	− 0.03	85 9 13 0	− 0.
	19	Moon I, N. . .	9	53 2.46	− 0.44	− 6.65	64 52 4 28	+ 3 47.67	+ 2 0.6	15 52 55.37	+70.55	116 4 13.8	.
	20	B. A. C. 5451 .	9	15 8.06	− 0.53	− 6.65	75 54 7.20	+ 3 55.01	+ 3 43.0	16 15 0.88	− 3.81	127 8 6.4	−18.
	21	Juno	4	28 4.97	− 0.31	− 6.65	42 21 57.58	+ 3 41.62	+ 51.9	16 27 58.01	. .	93 32 52.3	− 2.
	22	B. A. C. 5583 .	5	35 25.16	− 0.56	− 6.65	79 38 4.62	+ 3 44.21	+ 5 2.0	16 35 17.95	− 4.08	130 53 12.0	−16.
	23	B. A. C. 5584 .	4	35 23.27	− 0.56	− 6.65	79 38 4.62	+ 3 28.12	+ 5 1.8	16 35 26.06	− 4.08	130 52 55.7	−16.
	24	B. A. C. 5671 .	9	46 56 22	− 0.47	− 6.64	69 10 2.38	+ 4 19.24	+ 2 28.8	16 46 49.11	− 3.76	120 23 11.6	−14.
	25	κ Ophiuchi . .	9	52 0.78	− 0.23	− **6.64**	29 13 58.18	+ 5 15.25	+ 32.0	16 51 53.91	+ 0.07	60 26 6.6	+ 2.
	26	d Herculis. . .	9	57 13.69	− 0.04	− **6.69**	5 3 56.20	+ 4 53.82	+ 5.1	16 57 7.01	+ 0.24	56 15 16.3	+ 1.
	27	B. A. C. 5781 .	9	3 29.94	− 0.38	− 6.64	54 22 0.45	+ 4 44.92	+ 1 19.5	17 3 22.92	− 3.46	105 34 26.1	−11.
	28	Elpis. . . .	9	15 44.56	− 0.34	− 6.64	48 29 58.52	+ 6 56.26	+ 1 4.6	17 15 37.58	. .	99 44 20.6	− 3.
	29	O. Arg. S. 17137.	9	37 14.68	− 0.45	− 6.64	65 59 53.22	+ 2 4.90	+ 2 7.6	17 37 7.59	− 3.82	117 10 26.9	− 9.
	30	O. Arg. S. 17166.	9	38 19.29	− 0.45	− 6.64	65 59 53.22	+ 1 30.96	+ 2 7.5	17 38 12.20	− 3.83	117 9 52.9	− 9.
	31	Jupiter I, S. .	6	52 52.00	− 0.44	− 6.64	61 57 55.68	+ 3 55.35	+ 1 47.0	17 52 44.92	+ 1.80	113 9 59 2	−24.
	32	Jupiter II, N. .	5	55 55.60	− 0.44	− 6.64	61 57 55.68	+ 3 9.01	+ 1 47.0	17 55 48.52	− 1.80	113 9 12.9	+21.
	33	μ¹ Sagittarii .	9	6 35 21	− 0.42	− **6.62**	59 53 55.10	+ 3 32.66	+ 1 38.5	18 6 28.16	+ 0.02	111 5 27.5	+ 0.
	34	δ Ursæ Minoris .	5	12 10.80	+ 6.61	− 6.63	312 13 54.10	+ 4 26.09	− 1 2.7	18 12 10.78	− 0.28	3 23 38.7	+ 0.
	35	51 Cephei, S. P. .	5	42 22.96	− 8.86	− 6.63	306 3 59.45	+ 5 2.48	− 1 18.2	6 42 7.47	− 0.15	357 14 4.9	− 0.
	36	ζ Aquilæ (R.) .	.	. . .	. .	. .	154 43 57.12	+ 3 42.35	− 27.0	. . . .	. .	76 19 8.7	− 0.
	37	ζ Aquilæ . .	.	. . .	. .	. .	25 7 59.50	+ 4 23.00	+ 27.0	. . . .	. .	76 19 10.7	+ 1.
	38	δ Draconis (R.)	.	. . .	. .	. .	208 28 0.10	+ 4 24.90	+ 31.2	. . . .	. .	22 33 25.0	− 1.
	39	δ Draconis . .	5	12 40 37	+ 0.61	− 6.63	331 24 0.40	+ 3 37.32	− 31.2	19 12 34.35	− 0.03	22 33 27.7	+ 1.
	40	γ Aquilæ . . .	8	40 34.59	− 0.24	− **6.61**	28 29 56.08	+ 4 21.10	+ 31.3	19 40 27.73	+ 0.02	79 41 9.7	+ 0.
	41	α Aquilæ . . .	9	44 56.79	− 0.25	− **6.58**	30 15 58.65	+ 4 26.31	+ 33.6	19 44 49.92	0.00	81 27 19.8	− 0.
	42	β Aquilæ . . .	5	49 26.30	− 0 27	− **6.71**	32 44 1.62	+ 2 57.86	+ 37.0	19 49 19.41	+ 0.13	83 53 57.7	− 0.
S.	43	α Persei (R.) .	.	. . .	. .	. .	190 28 5.90	+ 3 24.46	+ 10.6	. . . .	. .	40 34 40.2	+ 1.
	44	α Persei . .	.	. . .	. .	. .	349 24 8.48	+ 4 20.71	− 10.6	. . . .	. .	40 34 39.8	+ 0.
	45	δ Persei . . .	8	34 17.40	+ 0.23	− 6.29	351 26 3.83	+ 4 7.19	− 8.5	3 34 11.34	+ 0.35	42 36 23.8	0.
	46	γ¹ Eridani . . .	9	52 25.09	− 0.65	− **6.31**	52 39 55.98	+ 3 47.33	+ 1 14.6	3 52 18.15	+ 0.05	103 51 19.1	+ 1.
	47	γ Tauri . . .	3	12 55.03	− 0.32	− **6.18**	23 27 59.25	+ 5 21.14	+ 24.8	4 12 48.43	− 0.08	74 40 6.4	+ 1.
	48	ε Tauri . . .	9	21 33.60	− 0.28	− **6.37**	19 53 57.32	+ 4 52.67	+ 20.6	4 21 27.04	+ 0.10	71 5 31.8	+ 3.
	49	α Tauri . . .	9	28 59.21	− 0.32	− **6.27**	22 33 55 50	+ 3 34.53	+ 23.6	4 28 52 61	− 0.02	73 44 14.8	+ 2.
	50	Mercury II, C. .	9	35 34.89	− 0.28	− 6.27	19 48 0.62	+ 4 25.65	+ 20.5	4 35 28.34	− 0.26	70 59 8.0	.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.19	81.5	81.7
2	30.17	81.8	82.5
6	30.17	84.3	84.0
7	30.12	76.2	74.3
11	30.13	75.2	73.4
16	30.13	73.5	72.3
17	30.07	67.0	64.6
23	30.05	65.6	63.2
42	30.10	61.2	58.0
44	30.22	65.4	65.0

For summary of the elements of reduction see page 3.

2, 3, 7, 20. One bisection.
8, 19. Three bisections.
34, 35. Five bisections.

ZENITH-POINT CORR.

	′ ″
No. 1 to 6	+ 1 2.42
No. 8 to 16	+ 1 2.77
No. 17 to 42	+ 1 0.40
No. 43 to 50	+ 1 1.17

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 2.3	+ 15 44.4	. .	+ 15 42.1
2	− 1.4	− 4.9	+ 0.1	− 6.1
3	− 1.4	+ 4.9	. .	+ 3.5
8	−47 37.9	+ 15 36.5	. .	− 32 1.5
19	−50 40.2	+ 15 18.7	. .	− 35 21
31	− 1.8	− 23.1	. .	− 24
32	− 1.8	+ 23.2	. .	+ 21
50	− 3.4	. . .	+ 0.5	− 1

ATE LND BS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
ne 22	1	9 Camelopard. .	5	41 55.91	+ 1.05	− 6.27	332 41 55.85	+ 4 18.53	− 29.2	4 41 50.69	+ 0.68	23 52 6.4	+ 1.9
23	2	Sun I, N. . .	9	8 48.60	− 0.20	− 6.24	15 7 57.52	+ 3 28.84	+ 15.3	6 8 42.16	+68.94	66 18 2.9	. .
S.	3	Sun II, S. . .	9	11 6.49	− 0.20	− 6.24	15 37 53.70	+ 5 4.09	+ 15.8	6 11 0.05	−68.95	66 49 34.8	. .
	4	Venus I, N. .	6	6 31.47	− 0.20	− 6.22	15 9 53.10	+ 3 17.82	+ 15.3	7 6 25.05	+ 0.42	66 19 47.4	. .
	5	Venus II, S. .	5	6 32.28	− 0.20	− 6.22	15 9 53.10	+ 3 30.56	+ 15.3	7 6 25.86	− 0.39	66 20 0.2	. .
	6	α Canis Minoris .	9	32 59.03	− 0.43	− **6.14**	33 15 56.72	+ 4 46.17	+ 36.9	7 32 52.39	− 0.17	84 27 41.0	+ 2.8
	7	β Geminorum. .	9	37 54.58	− 0.13	− **6.21**	10 29 52.88	+ 4 14.69	+ 10.5	7 37 48.25	− 0.01	61 40 39.3	+ 3.4
	8	15 Argus . . .	9	2 25.71	− 0.75	− 6.19	62 43 53.00	+ 5 7.08	+ 1 48.5	8 2 18.77	+ 0.17	113 57 9.8	+ 4.4
	9	ε Hydræ . . .	9	40 23.30	− 0.41	− **6.24**	31 55 56.95	+ 5 2.71	+ 34.9	8 40 16.71	+ 0.01	83 7 55.8	+ 4.4
	10	Polaris, s. p. .	5	13 53.84	−33.11	− 6.16	307 29 53.58	+ 4 6.78	− 1 12.8	1 13 14.57	− 4.06	358 39 8.8	+ 2.2
	11	η Ursæ Maj., (R.) .	.	. . .	. .	. .	190 57 53.88	+ 3 56.80	+ 11.0	. . . . .	. .	40 4 19.5	− 0.8
	12	η Ursæ Majoris .	.	. . .	. .	. .	348 53 56.35	+ 4 15.25	− 11.0	. . . . .	. .	40 4 21.8	+ 1.5
	13	η Bootis . . .	9	48 58.69	− 0.23	− **6.21**	19 47 57.08	+ 4 37.18	+ 20.3	13 48 52.30	+ 0.01	70 59 15.8	+ 2.5
	14	α Bootis . . .	9	10 12.04	− 0.21	− **6.11**	18 59 57.42	+ 4 8.41	+ 19.5	14 10 5.67	− 0.03	70 10 46.5	+ 3.5
	15	ρ Bootis (R.) . .	.	. . .	. .	. .	171 55 52.62	+ 5 14.66	− 8.0	. . . . .	. .	59 5 21.9	− 5.7
	16	ρ Bootis	.	. . .	. .	. .	7 53 57.90	+ 4 55.94	+ 8.0	. . . . .	. .	59 5 23.0	− 5.7
	17	B. A. C. 5164 .	8	31 42.31	+ 0.37	− 6.15	348 43 54.75	+ 3 34.70	− 11.2	15 31 36.53	− 3.14	39 53 39.4	− 3.5
	18	B. A. C. 5261 .	9	47 59.28	− 0.84	− 6.15	69 29 58.65	+ 4 43.66	+ 2 31.0	15 47 52.29	− 3.46	120 43 34.5	−19.1
	19	O. Arg. S. 15068	9	51 22.67	− 0.77	− 6.15	63 55 58.30	+ 3 39.08	+ 1 55.7	15 51 15.75	− 3.36	115 7 54.3	−17.8
	20	B. A. C. 5522 .	9	25 21.97	− 0.86	− 6.15	70 3 56.52	+ 4 41.18	+ 2 35.3	16 25 14.96	− 3.69	121 17 34.2	−16.5
	21	η Herculis. . .	9	38 49.86	+ 0.10	− **6.14**	359 39 56.70	+ 4 24.12	− 0.3	16 38 43.81	− 0.01	50 50 41.7	+ 2.6
	22	9 Camelop., s. p. .	9	41 58.79	− 2.26	− 6.15	284 59 57.62	+ 5 5.27	− 3 27.2	4 41 50.38	+ 0.35	336 7 56.9	+ 1.5
	23	Moon I, S. . .	9	51 2.18	− 0.81	− 6.15	67 25 59.75	+ 3 59.29	+ 2 16.2	16 50 55.22	+71.25	118 38 36.4	. .
	24	α^1 Herculis. . .	9	9 11.89	− 0.30	− **6.12**	24 15 56.78	+ 5 30.36	+ 25.7	17 9 5.45	0.00	75 28 14.0	+ 1.5
	25	Elpis. . . .	9	14 54.50	− 0.59	− 6.14	48 31 56.82	+ 5 13.68	+ 1 4.4	17 14 47.77	. .	99 44 36.1	− 3.6
	26	Groom. 966, s. p.	9	23 26.37	− 3.35	− 6.14	293 49 59.55	+ 3 23.92	− 2 7.5	5 23 16.88	− 0.29	344 57 37.2	+ 3.4
	27	α Ophiuchi . .	9	29 23.07	− 0.33	− **6.09**	26 9 54.85	+ 4 20.92	+ 28.0	17 29 16.59	− 0.02	77 21 5.0	+ 1.5
	28	Anonymous . .	9	37 36.32	− 0.82	− 6.15	67 3 57.80	+ 3 47.59	+ 2 13.8	17 37 29.35	− 3.87	118 16 20.4	−10.0
	29	μ Herculis. . .	9	41 47.98	− 0.12	− **6.09**	11 1 55.70	+ 4 2.33	+ 11.1	17 41 41.71	− 0.02	62 12 30.3	+ 1.8
	30	Jupiter I, N. .	6	52 18.87	− 0.75	− 6.16	61 58 0.52	+ 3 7.43	+ 1 46.4	17 52 11.96	+ 1.73	113 9 15.6	+21.3
	31	Jupiter II, S. .	5	52 22.34	− 0.75	− 6.16	61 58 0.52	+ 3 53.68	+ 1 46.5	17 52 15.43	− 1.74	113 10 1.9	−25.0
	32	γ^2 Sagittarii . .	6	58 5.52	− 0.85	− **6.27**	69 11 54.78	+ 4 46.98	+ 2 28.9	17 57 58.51	+ 0.10	120 25 31.9	− 0.8
	33	22 Camelop., s. p. .	9	5 26.57	− 2.54	− 6.16	288 13 55.98	+ 4 16.08	− 2 49.9	6 5 17.87	+ 0.41	339 21 43.4	+ 1.8
	34	δ Ursæ Minoris .	9	12 3.73	+11.96	− 6.17	312 13 55.70	+ 4 24.82	− 1 2.3	18 12 9.52	− 1.45	3 23 39.4	+ 1.9
	35	ι Aquilæ . . .	9	28 41.00	− 0.58	− **6.17**	47 7 59.98	+ 4 25.53	+ 1 1.3	18 28 34.25	+ 0.08	98 19 48.0	+ 1.4
	36	α Lyræ. . . .	9	32 55.41	+ 0.07	− **6.07**	0 9 56.30	+ 3 36.16	+ 0.2	18 32 49.31	− 0.07	51 19 53.9	+ 0.2
	37	51 Cephei, s. p. .	5	42 29.90	−15.86	− 6.18	306 3 55.12	+ 5 8.09	− 1 17.7	6 42 7.86	+ 0.16	357 14 6.7	+ 1.5
	38	β Lyræ. . . .	8	45 41.46	+ 0.06	− **6.25**	5 35 54.95	+ 4 31.08	+ 5.7	18 45 35.34	+ 0.11	56 46 52.9	+ 1.0
	39	d Sagittarii . .	9	10 36.84	− 0.70	− **6.23**	57 58 0.10	+ 4 21.74	+ 1 31.0	19 10 29.95	+ 0.07	109 10 14.0	+ 4.2
	40	Pallas . . .	9	21 5.81	− 0.21	− 6.19	17 9 57.08	+ 6 32.79	+ 17.7	19 20 59.41	. .	68 23 8.8	− 1.0
. 25	41	ζ Ophiuchi . .	9	30 33.20	− 0.30	− **6.40**	49 7 56.10	+ 3 50.40	+ 1 4.3	16 30 26.53	+ 0.03	100 19 12.0	+ 1.9
	42	η Herculis . .	9	38 50.04	+ 0.08	− **6.31**	359 39 49.12	+ 4 31.28	− 0.3	16 38 43.76	− 0.05	50 50 41.3	+ 2.7
	43	9 Camelop., s. p. .	9	41 58.29	− 1.44	− 6.36	284 59 46.25	+ 5 11.13	− 3 23.1	4 41 50.49	+ 0.37	336 7 55.5	+ 0.5
	44	κ Ophiuchi . .	9	52 0.50	− 0.18	− **6.40**	29 13 55.78	+ 5 18.95	+ 31.3	16 51 53.96	+ 0.11	80 26 7.2	+ 3.1
	45	ε Ursæ Minoris .	9	58 47.84	+ 3.05	− 6.35	316 35 52.35	+ 4 32.03	− 52.5	16 58 44.54	− 0.08	7 45 53.1	+ 1.4
	46	α^1 Herculis . .	9	9 11.99	− 0.15	− **6.37**	24 15 52.20	+ 5 35.94	+ 25.2	17 9 5.49	+ 0.04	75 28 14.5	+ 2.3
	47	α Ophiuchi . .	9	29 23.13	− 0.17	− **6.30**	26 9 48.82	+ 4 27.98	+ 27.5	17 29 16.62	0.00	77 21 5.5	+ 2.4
	48	ω Draconis . .	9	37 49.50	+ 0.86	− 6.34	330 1 53.92	+ 3 31.06	− 32.1	17 37 44.02	− 0.01	21 11 14.1	− 0.6
	49	ψ^1 Draconis . .	5	44 16.81	+ 1.08	− 6.33	326 37 55.38	+ 3 55.82	− 36.6	17 44 11.56	0.00	17 47 35.8	+ 1.5

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.22	68.8	67.5
30.21	69.5	70.7
30.19	73.0	72.8
30.16	75.4	74.3
30.08	70.0	69.0
30.08	69.2	67.5
30.08	67.2	65.2
30.08	66.0	64.1
. .	. .	62.2
30.03	63.0	61.0
29.98	74.3	73.0
29.97	73.0	72.3

For summary of the elements of reduction see page 3.

23, 37. Three bisections.

ZENITH-POINT CORR.

		′ ″
No. 1 to 9	+	1 1.17
No. 10 to 40	+	1 0.72
No. 41 to 49	+	1 0.28

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 2.3	+ 15 45.9	. .	+ 15 43.6
3	− 2.4	− 15 45.9	. .	− 15 48.3
4	− 1.4	+ 6.4	. .	+ 5.0
5	− 1.4	− 6.4	+ 0.0	− 7.8
23	−51 14.7	− 15 10.8	. .	− 66 25.5
30	− 1.8	+ 23.1	. .	+ 21.3
31	− 1.8	− 23.2	. .	− 25.0

DATE AND OBS'R.	Number.	OBJECT.	Thread.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
June 25	1	ψ^2 Draconis . .	5	44 18.61	+ 1.08	− 6.33	326 37 55.38	+ 3 25.29	− 36.6	17 44 13.36	− 3.84	17 47 5.3	− 5
P.	2	Jupiter I, N. .	5	51 12.76	− 0.40	− 6.33	61 57 54.95	+ 3 19.38	+ 1 44.5	17 51 6.03	+ 1.72	113 9 20.0	.
	3	Jupiter II, S. .	6	51 16.20	− 0.40	− 6.33	61 57 54.95	+ 4 4.14	+ 1 44.6	17 51 9.47	− 1.72	113 10 4.9	.
	4	δ Ursæ Minoris .	9	12 9.59	+ 7.21	− 6.32	312 13 51.65	+ 4 25.78	− 1 1.2	18 12 10.48	− 0.28	3 23 37.4	+ 0
	5	Anonymous .	9	29 44.63	− 0.43	− 6.31	66 9 50.42	+ 5 9.64	+ 2 6.0	18 29 37.89	− 3.94	117 23 27.3	− 5
	6	α Lyræ . . .	9	32 55.71	+ 0.02	− **6.31**	0 9 51.72	+ 3 40.45	+ 0 2	18 32 49.42	+ 0.03	51 19 53.6	+ 0
	7	β Lyræ . . .	9	45 41.64	− 0.03	− **6.31**	5 36 . .	. .	. .	18 45 35.31	+ 0.05	. . . .	.
	8	Moon I, S. . .	9	46 49.29	− 0.43	− 6.30	66 55 51.32	+ 3 36.20	+ 2 10.4	18 46 42.56	+69.16	118 7 59.1	.
	9	Moon II. . .	9	49 8.09	− 0.43	− 6.30	66 40 . .	. .	. .	18 49 1.36	−69.64	. . . .	.
	10	ζ Aquilæ . . .	9	59 54.99	− 0.19	− **6.29**	25 7 53.42	+ 4 29.77	+ 26.2	18 59 48.50	+ 0.10	76 19 10.6	+ 2
	11	Pallas . . .	9	19 34.19	− 0.14	− 6.29	17 11 50.32	+ 4 35.23	+ 17.3	19 19 27.76	. .	68 23 4.1	− 1
F.	12	α Aurigæ . . .	9	7 43.18	+ 0.22	− **6.30**	352 57 46.05	+ 3 40.53	− 6.6	5 7 37.11	0.00	44 7 41.2	+ 1
	13	β Orionis . . .	8	8 44.80	− 0.35	− **6.30**	47 7 54.82	+ 5 18.65	+ 58.5	5 8 38.16	+ 0.01	98 20 33.2	+ 2
	14	β Tauri . . .	9	18 38.20	− 0.03	− **6.27**	10 17 50.95	+ 5 25.54	+ 9.9	5 18 31.88	− 0.01	61 29 47.0	+ 1
26	15	Sun, S.	.	. . .	. .	. .	15 43 52.85	+ 3 50.11	+ 15.2	. . . . .	. .	66 54 19.4	.
	16	Sun II, N. . .	9	23 33.90	− 0.09	− 6.29	15 11 52.85	+ 4 19.81	+ 14.7	6 23 27.52	−68.90	66 22 48.6	.
P. 28	17	α Scorpii . . .	9	22 2.12	− 0.47	− **6.02**	64 55 54.02	+ 5 26.07	+ 2 1.4	16 21 55.59	− 0.06	116 9 42.7	+ 1
	18	Juno	9	24 5.34	− 0.29	− 6.06	42 25 52.12	+ 5 43.97	+ 52.1	16 23 58.99	. .	93 38 49.4	− 2
	19	ζ Ophiuchi . .	9	30 32.93	− 0.34	− **6.08**	49 7 54.52	+ 3 49.91	+ 1 5.8	16 30 26.52	+ 0.01	100 19 11.4	+ 1
	20	B. A. C. 5583 .	6	35 24.61	− 0.61	− 6.07	79 37 53.25	+ 3 57.43	+ 5 2.6	16 35 17.93	− 4.10	130 53 14.5	−17
	21	B. A. C. 5584 .	6	35 32.77	− 0.61	− 6.07	79 37 53.25	+ 3 37.65	+ 5 2.4	16 35 26.04	− 4.10	130 52 54.5	−17
	22	η Herculis . .	9	38 49.79	+ 0.11	− **6.10**	359 39 54.55	+ 4 23 99	− 0.3	16 38 43.83	+ 0.03	50 50 39.4	+ 1
	23	B. A. C. 5671 .	9	46 55.70	− 0.50	− 6.08	69 9 51.75	+ 4 32.54	+ 2 29.0	16 46 49.12	− 3.79	120 23 14.5	−14
	24	O. Arg. S. 16183^1	6	52 37.93	− 0.45	− 6.08	62 45 51.15	+ 7 1.72	+ 1 50.8	16 52 31.40	− 2.64	114 1 4.9	−13
	25	O. Arg. S. 16183^2	5	52 38.42	− 0.45	− 6.08	62 45 51.15	+ 6 56.04	+ 1 50.8	16 52 31.89	− 3.64	114 0 59.2	−13
	26	ε Ursæ Minoris .	5	58 46.75	+ 3.37	− 6.08	316 35 47.02	+ 4 36.64	− 53.7	16 58 44.04	− 0.34	7 45 51.2	+ 0
	27	B. A. C. 5825 .	9	10 45.74	− 0 54	− 6.09	73 37 52.15	+ 3 45.53	+ 3 12.3	17 10 39.11	− 4.05	124 51 11.2	−13
	28	Anonymous .	6	16 31.07	− 0.24	− 6.09	36 11 51.38	+ 1 33.53	+ 41.8	17 16 24.74	− 3.24	87 20 27.9	− 8
	29	Anonymous .	6	16 36.82	− 0.24	− 6.09	36 11 51.38	+ 4 0.21	+ 41.8	17 16 30.49	− 3.24	87 22 54.6	− 8
	30	Durch. 16°, 3211^1	6	26 41.20	− 0.14	− 6.10	22 23 53.48	+ 5 17.84	+ 23.6	17 26 34.96	− 3.12	73 35 56.1	− 7
	31	Durch. 16°, 3211^2	5	26 42.04	− 0.14	− 6.10	22 23 53.48	+ 5 4.90	+ 23.6	17 26 35.80	− 3.12	73 35 43.2	− 7.
	32	Weisse (2) 817 .	9	28 18.68	− 0.14	− 6.10	22 23 53.48	+ 5 6.63	+ 23.6	17 28 12.44	− 3.12	73 35 44.9	− 7.
	33	Jupiter I. N. .	6	49 34.65	− 0.45	− 6.12	61 57 52.78	+ 3 22.17	+ 1 47.0	17 49 28.08	+ 1.73	113 9 23.2	.
	34	Jupiter II, S. .	5	49 38.12	− 0.45	− 6.12	61 57 52.78	+ 4 7.17	+ 1 47.0	17 49 31.55	− 1.74	113 10 8.2	.
	35	δ_2 Ursæ Minoris .	5	12 8.94	+ 8.10	− 6.13	312 13 51.10	+ 4 26.73	− 1 2.7	18 12 10.91	+ 0.50	3 23 36.3	+ 0.
	36	η Serpentis . .	9	15 6.57	− 0.30	− **6.16**	41 43 52.65	+ 4 47.01	+ 51.0	18 15 0.14	+ 0.13	92 55 51.9	+ 2.
	37	α Lyræ . . .	9	32 55.47	+ 0.09	− **6.11**	0 10 . .	. .	. .	18 32 49.42	0.00	. . . .	.
F. 29	38	ζ Ophiuchi . .	9	30 33.01	− 0.64	− **5.86**	49 7 49.80	+ 3 57.09	+ 1 5.1	16 30 26.59	+ 0.08	100 19 13.2	+ 3.
	39	d Herculis . .	9	57 12.82	− 0.07	− **5.78**	5 3 47.82	+ 5 1.75	+ 5.1	16 57 6.94	+ 0.16	56 15 15.9	+ 2.
	40	B. A. C. 5781 .	9	3 29.51	− 0.70	− 5.81	54 21 47.92	+ 4 59.47	+ 1 18.7	17 3 23.00	− 3.50	105 34 27.3	−11.
	41	α^1 Herculis . .	5	9 11.60	− 0.35	− **5.77**	24 15 50.12	+ 5 38.06	+ 25.5	17 9 5.43	− 0.03	75 28 14.9	+ 3.
	42	α^2 Herculis . .	6	9 11.97	− 0.35	− 5.82	24 15 50.12	+ 5 39.01	+ 25.5	17 9 5.80	− 3.12	75 28 15.8	− 7.
	43	Lalande 31762 .	8	20 4.29	− 0.01	− 5.83	1 45 48.55	+ 5 47.83	+ 1.8	17 19 58.45	− 3.04	52 57 59.4	− 5.
	44	B. A. C. 5895 .	8	20 20.51	− 0.01	− 5.83	1 45 48.55	+ 4 8.35	+ 1.8	17 20 14.67	− 3.04	52 56 19.9	− 5.
	45	Weisse (2) 817 .	9	28 18.52	− 0.33	− 5.84	22 23 42.45	+ 5 17.94	+ 23.3	17 28 12.35	− 3.12	73 35 44.9	− 6.
	46	ψ^1 Draconis . .	6	44 15.88	+ 1.71	− 5.86	326 37 44.72	+ 4 3.84	− 37.1	17 44 11.73	+ 0.24	17 47 32.7	− 0.
	47	ψ^2 Draconis . .	5	44 17.79	+ 1.71	− 5.86	326 37 44.72	+ 3 34.97	− 37.1	17 44 13.64	− 3.77	17 47 3.8	− 4.
	48	Jupiter I, N. .	6	49 2.50	− 0.79	− 5.86	61 57 42.35	+ 3 33.24	+ 1 45.8	17 48 55.85	+ 1.77	113 9 22.6	.
	49	Jupiter II, S. .	5	49 6.04	− 0.79	− 5.86	61 57 42.35	+ 4 19.92	+ 1 45.8	17 48 59.39	− 1.77	113 10 9.3	.
	50	γ^2 Sagittarii . .	9	58 5.24	− 0.88	− **5.88**	69 11 49.20	+ 4 56.04	+ 2 28.0	17 57 58.49	0.00	120 25 34.4	+ 1.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	29.99	72.7	71.7
10	29.98	72.8	71.7
12	30.02	85.2	87.3
15	29.96	87.0	89.7
17	30.08	65.4	63.4
26	30.08	63.9	62.3
34	30.09	63.6	61.7
37	30.10	62.6	61.5
38	30.10	70.6	69.0
45	30.11	69.8	68.2

For summary of the elements of reduction see page 3.

4. Five bisections.
8, 26, 35. Three bisections.
15. One bisection.

ZENITH-POINT CORR.

		′ ″
No. 1 to 11	+	1 0.28
No. 12 to 16	+	59.79
No. 17 to 36	+	1 0.62
No. 38 to 50	+	1 0.12

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 1.8	+ 22.4	. .	+ 20.
3	− 1.8	− 22.5	. .	− 24.
8	−50 17.5	− 14 57.3	. .	− 65 14.
15	− 2.4	− 15 45.4	. .	− 15 47.
16	− 2.3	+ 15 45.4	. .	+ 15 43.
33	− 1.8	+ 22.5	. .	+ 20.
34	− 1.8	− 22.5	. .	− 24.
48	− 1.8	+ 23.3	. .	+ 21.
49	− 1.8	− 23.4	. .	− 25.

.TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
ıe 29	1	μ¹ Sagittarii . .	9	6 34.90	− 0.76	− **5.89**	59 54 . .	. . .	. .	18 6 28.26	+ 0.04	. . . . .	. .
F.	2	δ Ursæ Minoris .	5	12 5.14	+11.84	− 5.88	312 13 46.65	+ 4 31.21	− 1 2.0	18 12 11.10	+ 0.79	3 23 37.1	+ 1.4
	3	α Lyræ. . . .	9	32 55.32	+ 0.02	− **5.88**	0 9 45.28	+ 3 46.15	+ 0.2	18 32 49.46	+ 0.03	51 19 52.8	+ 0.9
	4	51 Cephei, S. P. .	5	42 31.32	−15.84	− 5.87	306 3 48.40	+ 5 12.74	− 1 17.2	6 42 9.61	+ 1.27	357 14 5.1	+ 1.7
	5	Anonymous. .	8	28 6.58	− 0.85	− 5.86	65 23 51.32	+ 7 40.29	+ 2 3.6	19 27 59.87	− 3.96	116 39 56.4	+ 1.0
	6	Mur. Zones 176, 77	8	28 30.76	− 0.85	− 5.86	65 23 51.32	+ 1 49.83	+ 2 3.0	19 28 24.05	− 3.96	116 34 5.4	+ 1.0
	7	κ Cephei (R.) . .	.	. . .	. .	. .	218 21 43.95	+ 4 10.23	+ 44.9	. . . . .	. .	12 39 42.1	− 2.3
	8	κ Cephei . . .	.	. . .	. .	. .	321 29 49.38	+ 4 18.77	− 44.9	. . . . .	. .	12 39 44.5	+ 0.1
	9	π Capricorni . .	9	20 26.87	− 0.74	− **5.74**	57 23 48.72	+ 5 6.30	+ 1 28.6	20 20 20.29	− 0.06	108 36 44.8	+ 2.6
	10	ε Delphini (R.) .	.	. . .	. .	. .	151 55 45.22	+ 4 17.11	− 30.1	. . . . .	. .	79 6 49.0	+ 1.5
	11	ε Delphini . .	.	. . .	. .	. .	27 55 48.85	+ 4 9.10	+ 30.1	. . . . .	. .	79 6 49.3	+ 1.8
	12	μ Capricorni . .	9	46 45.06	− 0.70	− **5.87**	52 55 47.38	+ 4 13.05	+ 1 15.2	21 46 38.56	+ 0.07	104 7 36.8	+ 2.7
	13	79 Draconis . .	5	51 26.28	+ 1.79	− 5.80	325 41 49.35	+ 5 25.22	− 38.6	21 51 22.27	+ 0.10	16 52 57.2	+ 2.6
	14	α Aquarii . . .	9	59 37.17	− 0.55	− **5.81**	39 43 46.35	+ 3 56.97	+ 47.2	21 59 30.82	+ 0.03	90 54 51.7	+ 1.2
	15	Moon II, N.. .	9	9 33.21	− 0.68	− 5.79	51 1 45.82	+ 3 8.82	+ 1 10.2	22 9 26.74	−62.24	102 12 26.0	. .
y 1 S.	16	ι Piscium . . .	9	33 45.56	− 0.09	− **5.65**	33 50 . .	. . .	. .	23 33 39.87	+ 0.02	. . . . .	. .
	17	Moon II. N. .	9	37 3.37	− 0.12	− 5.60	39 39 40.12	+ 6 16.47	+ 46.2	23 36 57.65	−61.44	90 53 4.0	. .
	18	α Andromedæ .	9	2 9.48	+ 0.02	− **5.57**	10 23 56.68	+ 4 47.48	+ 10.3	0 2 3.91	+ 0.01	61 35 15.7	+ 2.0
	19	γ Pegasi . . .	9	7 1.93	− 0.08	− **5.56**	24 17 56.18	+ 5 9.95	+ 25.2	0 6 56.26	− 0.02	75 29 52.5	+ 1.9
	20	β Ceti	9	37 32.92	− 0.24	− **5.63**	57 27 55.50	+ 3 38.50	+ 1 27.1	0 37 27.10	+ 0.11	108 39 22.3	+ 1.6
	21	Polaris . . .	5	13 18.12	+13.36	− 5.57	310 9 59.85	+ 5 39.77	− 1 5.6	1 13 25.91	− 0.35	1 20 55.2	+ 1.9
	22	η Piscium . . .	9	25 1.58	− 0.16	− **5.52**	24 5 56.48	+ 4 26.55	+ 25.0	1 24 55.85	+ 0.03	75 17 9.2	+ 1.9
. 6	23	ζ Ophiuchi . .	9	30 32.82	− 0.44	− **5.87**	49 8 1.38	+ 3 44.77	+ 1 4.7	16 30 26.51	0.00	100 19 12.1	+ 2.6
	24	XVI, 18 . . .	9	37 44.17	− 0.65	− 5.87	72 23 58.30	+ 4 7.17	+ 2 55.0	16 37 37.65	− 3.85	123 37 21.7	−16.6
	25	η Herculis . .	9	38 49.62	+ 0.04	− **5.91**	359 40 0.62	+ 4 16.51	− 0.3	16 38 43.79	+ 0.04	50 50 38.0	+ 2.2
	26	B. A. C. 5686 .	9	47 55.79	− 0.23	− 5.88	23 11 55.42	+ 4 42.59	+ 24.1	16 47 49.68	− 3.07	74 23 23.3	− 6.6
	27	κ Ophiuchi . .	9	52 0.08	− 0.29	− **5.86**	29 13 57.62	+ 5 15.12	+ 31.4	16 51 53.91	+ 0.05	80 26 5.3	+ 2.9
	28	ε Ursæ Minoris .	9	58 45.86	+ 3.72	− 5.88	316 35 53.40	+ 4 27.95	− 52.8	16 58 43.70	+ 0.08	7 45 49.8	+ 1.0
	29	B. A. C. 5793 .	9	5 9.40	− 0.65	− 5.88	71 3 58.40	+ 4 26.12	+ 2 42.4	17 5 2.87	− 3.96	122 17 28.1	−14.0
	30	α¹ Herculis . .	9	9 11.60	− 0.25	− **5.86**	24 15 54.45	+ 5 31.56	+ 25.4	17 9 5.47	0.00	75 28 12.6	+ 2.5
	31	Gerda . . .	9	16 33.13	− 0.55	− 5.88	59 33 56.10	+ 5 6.75	+ 1 35.1	17 16 26.70	. .	110 46 59.4	− 3.5
	32	B. A. C. 1662, S.P.	5	22 55.71	− 7.16	− 5.88	303 57 55.08	+ 4 52.09	− 1 22.8	17 22 42.67	+ 3.18	355 7 45.6	− 2.1
	33	XVII, 10. . .	9	30 6.01	− 0.63	− 5.88	69 35 56.22	+ 5 16.49	+ 2 30.2	17 29 59.50	− 4.03	120 50 4.1	−11.4
	34	Durch. 22°, 3173	9	33 10.82	− 0.18	− 5.88	16 43 55.62	+ 4 26.40	+ 16.9	17 33 4.76	− 3.10	67 55 0.1	− 4.6
	35	XVII, 16 . .	9	40 21.24	− 0.55	− 5.88	59 35 55.75	+ 3 36.88	+ 1 35.5	17 40 14.81	− 3.76	110 47 29.3	− 9.3
	36	XVII, 19 . .	7	43 33.67	− 0.69	− 5.88	75 11 58.25	+ 4 11.32	+ 3 29.7	17 43 27.10	− 4.31	126 26 0.4	−10.8
	37	B. A C. 1879, S.P.	5	57 59.63	−10.48	− 5.88	305 35 53.22	+ 4 51.84	− 1 18.0	17 57 43.27	+ 5.36	356 45 48.3	− 3.0
	38	B. A. C. 6166 .	9	5 47.46	− 0.65	− 5.88	70 45 55.58	+ 4 56.83	+ 2 40.1	18 5 40.93	− 4.20	121 59 53.7	− 8.0
	39	δ Ursæ Minoris .	9	12 6.36	+ 9.11	− 5.88	312 13 56.45	+ 4 17.82	− 1 1.6	18 12 9.59	+ 0.04	3 23 33.9	+ 0.5
	40	α Lyræ. . . .	9	32 55.36	+ 0.02	− 5.89	0 9 56.25	+ 3 32.00	+ 0.2	18 32 49.49	+ 0.03	51 19 49.6	− 0.2
	41	51 Cephei, S. P.. .	5	42 28.40	−12.20	− 5.89	306 3 56.30	+ 5 0.91	− 1 16.7	6 42 10.31	+ 1.31	357 14 1.7	+ 0.6
	42	Pallas . . .	9	10 43.50	− 0.19	− 5.89	17 29 57.18	+ 5 14.32	+ 17.8	19 10 37.42	. .	68 41 50.5	− 1.0
	43	Piazzi VII, 67, S.P.	9	18 12.67	− 1.94	− 5.89	287 35 52.90	+ 3 35.55	− 2 54.6	7 18 4.84	− 0.18	338 42 55.0	+ 1.4
	44	B. A. C. 6681 .	9	23 41.66	+ 0.45	− 5.89	341 3 59.45	+ 3 15.57	− 19.2	19 23 36.22	− 2.96	32 13 17.0	− 3.4
	45	B. A. C. 6763¹ .	5	38 41.35	+ 0.24	− 5.89	348 35 53.72	+ 3 34.45	− 11.3	19 38 35.70	− 2.91	39 45 38.1	− 3.0
	46	B. A. C. 6763² .	6	38 44.17	+ 0.24	− 5.89	348 35 53.72	+ 4 2.06	− 11.3	19 38 38.52	− 2.91	39 46 5.7	− 3.0
	47	λ Ursæ Minoris .	5	47 10.40	+29.74	− 5.89	309 53 57.68	+ 4 45.05	− 1 7.0	19 47 34.25	+ 0.76	1 3 56.9	+ 0.7
	48	B. A. C. 7029 (R.)	.	. . .	. .	. .	172 49 55.52	+ 4 10.11	− 7.0	. . . . .	. .	58 12 22.6	− 0.7
	49	B. A. C. 7029 .	.	. . .	. .	. .	7 1 54.35	+ 4 0.75	+ 7.0	. . . . .	. .	58 12 23.3	− 0.7
	50	B. A. C. 7077 .	8	25 43.27	− 0.60	− 5.90	64 11 57.20	+ 1 5.77	+ 1 56.0	20 25 36.77	− 3.95	115 21 20.2	+ 7.0

Barom.	At. Ther.	Ex. Ther.	*For summary of the elements of reduction see page 3.*	No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
in.	°	°			′ ″	′ ″	′ ″	′ ″
30.11	68.0	66.4		15	−41 56.9	+ 14 46.6	. .	− 27 10.3
30.08	65.0	64.5		17	−34 45.1	+ 14 54.6	. .	− 19 50.5
29.97	75.5	74.0						
30.01	74.8	73.5						
. .	. .	73.8						
30.00	72.3	70.3						
30.00	71.0	68.8						
29.99	69.0	67.6						

ZENITH-POINT CORR.

10, 11. One bisection.	No. 1 to 15	+ 1′ 0″.12
13, 15, 17, 21, 28, 32, 37, 39, 41. Three bisections.	No. 17 to 22	+ 1 2.20
2, 4, 47. Five bisections.	No. 23 to 50	+ 59.92

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
July 6	1	Anonymous .	8	25 59.52	− 0.60	− 5.90	64 11 57.20	+ 4 1.22	+ 1 56.2	20 25 53.02	− 3.95	115 24 15.8	+ 7
P.	2	Anonymous .	9	27 3.32	− 0.60	− 5.90	64 11 57.20	+ 7 9.64	+ 1 56.5	20 26 56.82	− 3.95	115 27 24.5	+ 7
	3	Ariadne . . .	9	31 30.59	− 0.51	− .90	53 50 1.00	+ 5 5 82	+ 1 17.1	20 31 24.18	. .	105 3 15.1	−
	4	α Cygni . . .	9	37 22.86	+ 0.11	− 5.90	353 57 55.15	+ 5 22.62	− 5.9	20 37 17.07	− 0.03	45 9 33.1	+ 0
	5	μ Aquarii . . .	9	46 11.03	− 0.46	− **5.98**	48 13 58.40	+ 5 7.87	+ 1 3.2	20 46 4.67	+ 0.15	99 26 30.7	+ 1
	6	ν Cygni . . .	9	52 43.87	+ 0.04	− **5.86**	358 7 54.52	+ 4 8.61	− 1.8	20 52 38.01	0.00	49 18 22.5	+ 2
	7	61¹ Cygni . . .	5	1 31.97	0.00	− **5.93**	0 39 58.12	+ 4 55.94	+ 0.7	21 1 26.07	+ 0.02	51 51 16.0	+ 1
	8	61² Cygni . . .	6	1 33.43	0.00	− 5.90	0 39 58.12	+ 5 4.93	+ 0.7	21 1 27.53	− 2.75	51 51 24.9	− 0
	9	Mu. *Zon.* 187, 66	9	7 8.42	− 0.56	− 5.90	59 21 57.68	+ 5 33.52	+ 1 35.2	21 7 1.96	− 3.66	110 35 27.6	+ 10
	10	O. Arg. S. 21237	9	8 8.13	− 0.56	− 5.90	59 21 57.68	+ 4 38.89	+ 1 35.2	21 8 1.67	− 3.66	110 34 33.0	+ 10
	11	α Cephei (R.) . . .		. . .	. .	. .	203 5 51.88	+ 3 55.17	+ 24.1	. . . .	. .	27 56 10.1	− 2
	12	α Cephei . . .	6	15 46.36	+ 0.59	− 5.90	336 45 57.02	+ 4 17.58	− 24.1	21 15 41.05	− 0.13	27 56 11.7	− 0
	13	Ceres . . .	9	21 53.52	− 0.61	− 5.90	65 33 59.40	+ 4 37.22	+ 2 3.9	21 21 47.01	. .	116 47 1.7	− 3
	14	ω Piscium . . .	9	53 8.34	− 0.34	− **5.85**	32 38 . .	. . .	. .	23 53 2.09	− 0.06	. . . . .	
E.	15	α Tauri . . .	9	28 59.11	− 0.47	− **5.67**	22 33 55.52	+ 3 33.62	+ 23.3	4 28 53.00	+ 0.02	73 44 13.6	+ 2
	16	ι Aurigæ . . .	9	49 6.10	− 0.24	− **5.58**	5 49 59.02	+ 5 18.06	+ 5.8	4 49 0.21	− 0.05	57 1 44.1	+ 1
	17	β Orionis . . .	3	8 44.77	− 0.71	− **5.69**	47 7 56.38	+ 5 11.89	+ 1 0.0	5 8 38.41	+ 0.04	98 20 29.5	+ 1
7	18	Sun I, N. . .	9	6 41.67	− 0.30	− 5.68	15 59 58.00	+ 5 5.91	+ 15.9	7 6 35.69	+ 68.51	67 11 41.0	.
	19	Sun II, S. . .	9	8 58.70	− 0.30	− 5.68	16 31 55.12	+ 4 39.95	+ 16.5	7 8 52.72	− 68.52	67 43 12.8	.
	20	ε Leonis . . .	9	38 59.37	− 0.20	− **5.77**	14 27 49.72	+ 5 11.83	+ 14.3	9 38 53.44	+ 0.01	65 39 37.1	+ 1.
	21	γ¹ Leonis . . .	9	13 18.77	− 0.26	− **5.69**	18 19 57.70	+ 5 38.38	+ 18.3	10 13 12.77	− 0.03	69 32 15.6	+ 2.
	22	β Bootis . . .	3	57 27.05	+ 0.04	− **5.55**	357 55 53.35	+ 5 14.42	− 1.9	14 57 21.51	0.00	49 7 27.1	+ 1.
	23	48 Cephei, S. P. .	9	4 56.79	− 3.75	− 5.58	296 7 53.22	+ 4 26.16	− 1 52.7	3 4 47.46	+ 0.61	347 16 47.9	+ 3.
	24	β Libræ . . .	9	10 32.49	− 0.64	− **5.60**	47 43 57.88	+ 4 35.80	+ 1 1.4	15 10 26.27	+ 0.02	98 55 56.3	+ 2.
	25	μ¹ Bootis . . .	9	19 59.04	− 0.02	− **5.58**	0 59 56.30	+ 5 10.28	+ 1.1	15 19 53.44	− 0.04	52 11 28.9	+ 0.
	26	α Cor. Bor. (R.) .	.	. . .	. .	. .	168 9 54.72	+ 4 19.22	− 11.6	. . . .	. .	62 52 18.9	+ 1.
	27	α Cor. Bor. . .	.	. . .	. .	. .	11 41 52.72	+ 3 53.61	+ 11.6	. . . .	. .	62 52 19.1	+ 2.
	28	ζ Ursæ Min. (R.) .	.	. . .	. .	. .	219 11 54.70	+ 3 59.87	+ 45.6	. . . .	. .	11 49 41.0	+ 1.
	29	ζ Ursæ Min. . .	7	48 36.58	+ 2.93	− 5.58	320 39 59.88	+ 4 8.38	− 45.6	15 48 33.93	+ 0.30	11 49 43.9	+ 4.
	30	Juno	9	19 12.37	− 0.58	− 5.59	42 41 58.70	+ 6 58.61	+ 51.8	16 19 6.20	. .	93 56 10.3	− 2.
	31	Weisse (2) 817 .	9	28 18.40	− 0.36	− 5.59	22 23 55.30	+ 5 3.97	+ 23.2	17 28 12.45	− 3.14	73 35 43.7	− 5.
	32	O. Arg. S. 17137	9	37 14.09	− 0.86	− 5.60	65 59 58.62	+ 2 3.27	+ 2 5.4	17 37 7.63	− 3.94	117 10 28.5	− 10.
	33	O. Arg. S. 17166	9	38 18.82	− 0.86	− 5.60	65 59 58.62	+ 1 31.46	+ 2 5.4	17 38 12.36	− 3.95	117 9 56.7	− 10.
	34	Jupiter I, S. .	6	44 53.83	− 0.81	− 5.60	61 57 55.98	+ 4 0.82	+ 1 45.2	17 44 47.42	+ 1.86	113 10 3.2	. .
	35	Jupiter II, N. .	5	44 57.56	− 0.81	− 5.60	61 57 55.98	+ 3 15.76	+ 1 45.2	17 44 51.15	− 1.87	113 9 18.1	. .
	36	B. A. C. 6103 .	9	56 44.20	− 0.98	− 5.60	74 43 57.10	+ 37.74	+ 3 22.5	17 56 37.62	− 4.34	125 54 18.5	− 9.4
	37	B. A. C. 6117 .	9	58 15.89	− 0.98	− 5.60	74 43 57.10	+ 8 3.72	+ 3 24.3	17 58 9.31	− 4.35	126 1 46.3	− 9.2
	38	B. A. C. 6145 .	9	2 20.37	− 0.91	− 5.60	69 32 0.00	+ 4 1.79	+ 2 29.7	18 2 13.86	− 4.15	120 44 52.7	− 3.3
	39	δ Ursæ Minoris .	8	12 2.79	+ 11.78	− 5.60	312 13 52.48	+ 4 21.94	− 1 1.7	18 12 8.97	− 0.40	3 23 33.9	+ 0.9
	40	B. A. C. 6285 .	9	23 11.76	− 0.95	− 5.60	71 49 47.00	+ 5 15.46	+ 2 50.2	18 23 5.21	− 4.30	123 4 13.9	− 6.2
	41	Anonymous .	9	24 30.73	− 0.95	− 5.60	71 49 47.00	+ 2 31.59	+ 2 49.7	18 24 24.18	− 4.30	123 1 29.5	− 6.1
	42	B. A. C. 6317 .	6	27 33.93	− 0.95	− 5.60	71 49 47.00	+ 12.97	+ 2 49.4	18 27 27.38	− 4.30	122 59 10.6	− 5.7
	43	B. A. C. 6344 .	9	31 37.68	− 0.95	− 5.60	71 49 47.00	+ 7 5.02	+ 2 50.6	18 31 31.13	− 4.32	123 6 3.8	− 5.3
	44	51 Cephei, S. P. .	7	42 30.36	− 15.90	− 5.60	306 3 56.58	+ 5 1.79	− 1 16.8	6 42 8.86	− 0.34	357 14 2.8	+ 2.0
	45	Pallas . . .	9	9 54.06	− 0.29	− 5.61	17 31 55.98	+ 6 35.11	+ 17.9	19 9 48.16	. .	68 45 10.2	− 1.1
	46	τ Draconis (R) .	.	. . .	. .	. .	214 7 49.82	+ 5 26.44	+ 38.3	. . . .	. .	16 52 26.6	− 2.2
	47	τ Draconis . .	5	18 1.98	+ 1.80	− 5.61	325 41 55.15	+ 4 52.53	− 38.3	19 17 58.17	+ 0.34	16 52 30.6	+ 1.8
	48	B. A. C. 6690 (R.)	.	. . .	. .	. .	168 43 54.58	+ 4 43.78	− 11.2	. . . .	. .	62 17 54.0	− 1.4
	49	B. A. C. 6690 .	.	. . .	. .	. .	11 7 53.38	+ 3 27.75	+ 11.2	. . . .	. .	62 17 53.5	− 1.4
	50	κ Aquilæ . . .	9	30 26.28	− 0.63	− **5.66**	46 5 58.20	+ 4 40.64	+ 58.7	19 30 20.04	+ 0.09	97 17 58.7	+ 3.6

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
13	30.00	67.5	66.3
15	30.14	73.5	74.0
19	30.14	78.6	79.5
21	30.14	83.0	81.5
22	30.14	76.0	75.0

For summary of the elements of reduction see page 3.

39, 44. Three bisections.

ZENITH-POINT CORR.

	″
No. 1 to 13	+ 59.92
No. 15 to 21	+ 59.50
No. 22 to 50	+ 59.58

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
18	− 2.4	+ 15 45.9	. .	+ 15 43.5
19	− 2.5	− 15 45.9	. .	− 15 48.4
34	− 1.8	− 22.5	. .	− 24.3
35	− 1.8	+ 22.6	. .	+ 20.8

TE D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
17.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
7	1	γ Aquilæ . . .	9	40 34.01	− 0.44	− **5.58**	28 29 58.55	+ 4 16.55	+ 30.7	19 40 27.96	0.00	79 41 7.0	+ 1.4
	2	α Aquilæ . . .	9	44 56.27	− 0.46	− **5.59**	30 15 51.95	+ 4 32.15	+ 33.0	19 44 50.20	+ 0.02	81 27 18.3	+ 1.1
8	3	α Ophiuchi . .	9	29 22.61	− 0.30	− **5.60**	26 10 . .	. .	. .	17 29 16.70	+ 0.03	. . . . .	. .
	4	ω Draconis . .	5	37 48.35	+ 1.06	− 5.61	330 1 57.05	+ 3 21.77	− 32.0	17 37 43.80	+ 0.01	21 11 8.0	− 2.6
	5	μ Herculis . .	9	41 47.49	− 0.14	− **5.55**	11 1 55.10	+ 4 0.47	+ 10.9	17 41 41.74	− 0.02	62 12 27.7	+ 2.9
	6	Jupiter I, S. .	3	44 24.56	− 0.61	− 5.61	61 58 0.28	+ 3 55.66	+ 1 44.2	17 44 18.34	+ 1.69	113 10 1.3	. .
	7	Jupiter, N. . .	.	. . .	. .	. .	61 58 0.28	+ 3 11.23	+ 1 44.2	. . . .	. .	113 9 16.9	. .
	8	δ Ursæ Minoris .	5	12 4.32	+ 9.66	− 5.62	312 13 54.18	+ 4 19.77	− 1 1.0	18 12 8.36	− 0.82	3 23 34.2	+ 1.5
	9	ι Aquilæ . . .	9	28 40.60	− 0.48	− **5.70**	47 7 55.30	+ 4 30.65	+ 1 0.0	18 28 34.49	+ 0.15	98 19 47.2	+ 2.4
	10	α Lyræ	9	32 55.11	+ 0.01	− **5.62**	0 9 54.55	+ 3 33.69	+ 0.2	18 32 49.49	+ 0.02	51 19 49.6	+ 0.4
	11	51 Cephei, S. P. .	5	42 27.16	−12.07	− 5.63	306 3 55.18	+ 5 1.20	− 1 16.0	6 42 8.56	− 0.86	357 14 1.6	+ 1.2
	12	ζ Aquilæ . . .	9	59 54.66	− 0.29	− **5.71**	25 7 52.98	+ 4 27.53	+ 26.2	18 59 48.73	+ 0.18	76 19 7.9	+ 2.5
	13	Durch. 21°, 3702.	8	9 1.34	− 0.22	− 5.65	17 35 55.32	+ 6 36.47	+ 17.8	19 8 55.47	− 3.15	68 49 10.8	− 1.4
	14	Pallas . . .	3	9 4.81	− 0.22	− 5.65	17 35 55.32	+ 6 14.52	+ 17.8	19 8 58.94	. .	68 48 48.8	− 1.0
	15	τ Aquilæ . . .	7	58 17.12	− 0.35	− **5.58**	31 52 1.10	+ 5 5.41	+ 34.7	19 58 11.10	− 0.06	83 4 2.4	+ 0.9
	16	α^2 Capricorni . .	9	11 23.63	− 0 53	− **5.67**	51 43 53.80	+ 3 59.20	+ 1 10.7	20 11 17.43	− 0.06	102 55 24.9	+ 1.5
	17	π Capricorni . .	9	20 26.86	− 0.58	− **5 70**	57 23 57.00	+ 4 58.19	+ 1 27.2	20 20 20.60	+ 0.06	108 36 43.6	+ 2.0
11	18	ι Aurigæ . . .	9	49 6.14	− 0.10	− **5.61**	5 49 56.85	+ 5 18.58	+ 5.8	4 49 0.39	− 0.02	57 1 42.4	+ 0.2
	19	α Aurigæ . . .	9	7 43.14	+ 0.12	− **5.68**	352 57 56.62	+ 3 29.81	− 6.8	5 7 37.61	+ 0.02	44 7 40.8	− 0.4
	20	β Orionis . . .	9	8 44.73	− 0.52	− **5.73**	47 7 54.12	+ 5 12 92	+ 1 0.1	5 8 38.56	+ 0.08	98 20 28.3	+ 0.8
	21	β Tauri . . .	9	18 38.01	− 0.15	− **5.59**	10 17 54.25	+ 5 20.18	+ 10.2	5 18 32.21	− 0.05	61 29 45.8	− 0.7
	22	δ Orionis . . .	9	25 50.43	− 0.44	− **5.68**	39 12 1.22	+ 4 10.82	+ 45.4	5 25 44.34	0.00	90 23 18.6	+ 0.6
	23	ε Orionis . . .	9	30 5.37	− 0.45	− **5.67**	40 5 57.28	+ 3 38.23	+ 46.9	5 29 59.27	+ 0.02	91 16 43.6	+ 1.0
	24	α Orionis . . .	7	48 37.75	− 0.38	− **5.61**	31 25 58.32	+ 3 59.44	+ 34.0	5 48 31.71	− 0.07	82 56 53.0	+ 0.3
12	25	Sun I, S. . .	9	27 7.86	− 0.22	− 5.66	17 9 57.05	+ 4 36.54	+ 17.2	7 27 1.98	+68.15	68 21 12.0	. .
	26	Sun II, N. . .	9	29 24.17	− 0.22	− 5.66	16 37 49.90	+ 5 11.14	+ 16.6	7 29 18.29	−68.16	67 49 38.8	. .
	27	τ Herculis . .	9	16 10.92	+ 0.34	− **5.71**	352 11 57.18	+ 5 25.57	− 7.6	16 16 5.56	+ 0.17	43 23 36.4	+ 1.3
	28	α Scorpii . . .	9	22 1.93	− 0.62	− **5.71**	64 56 5.02	+ 5 15.58	+ 1 59.5	16 21 55.61	− 0.01	116 9 41.3	− 0.4
	29	A Draconis . .	5	28 21.47	+ 1.40	− 5.70	329 48 0.45	+ 4 6.82	− 32.5	16 28 17.17	− 0.02	20 57 56.0	+ 0.2
	30	ζ Ophiuchi . .	9	30 32.70	− 0.45	− **5.75**	49 7 58.68	+ 3 46.03	+ 1 4.8	16 30 26.55	+ 0.05	100 19 10.7	+ 1.5
	31	η Herculis . .	9	38 49.16	+ 0.17	− 5.70	359 39 59.45	+ 4 17.03	− 0.3	16 38 43.63	− 0.06	50 50 37.4	+ 2.8
	32	B. A. C. 5686 .	9	47 55.46	− 0.17	− 5.70	23 11 57.18	+ 4 39.23	+ 24.1	16 47 49.59	− 3.05	74 23 21.7	− 5.7
	33	B. A. C. 5694 .	5	49 10.88	− 0.70	− 5.70	70 53 59.98	+ 4 14.66	+ 2 41.0	16 49 4.48	− 3.86	122 7 16.8	−15.7
	34	κ Ophiuchi . .	9	51 59.80	− 0.24	− **5.64**	29 13 57.65	+ 5 14.51	+ 31.5	16 51 53.86	+ 0.01	80 26 4.9	+ 3.4
	35	α^1 Herculis . .	9	9 11.37	− 0.19	− **5.70**	24 15 59.10	+ 5 25.11	+ 25.4	17 9 5.48	+ 0.02	75 28 10.8	+ 1.7
	36	Anonymous .	8	16 30.81	− 0.32	− 5.70	36 11 59.55	+ 1 26.12	+ 41.1	17 16 24.79	− 3.27	87 20 28.0	− 7.0
	37	Anonymous .	6	16 36.57	− 0.32	− 5.70	36 11 59.55	+ 3 51.68	+ 41.2	17 16 30.55	− 3.27	87 22 53.6	− 7.0
	38	44 Ophiuchi . .	9	19 1.78	− 0.60	− **5.80**	62 52 2.32	+ 3 35.16	+ 1 49.3	17 18 55.48	+ 0.14	114 3 48.0	+ 2.2
	39	ω Draconis . .	5	37 48.17	+ 1.36	− 5.70	330 1 57.45	+ 3 22.57	− 32.5	17 37 43.83	+ 0.15	21 11 8.9	− 0.5
	40	μ^1 Herculis. .	3	41 47.40	− 0.03	− **5.58**	11 1 55.12	+ 3 58.03	+ 11.0	17 41 41.67	− 0.08	62 12 25.4	+ 1.5
	41	δ Ursæ Minoris . .	5	12 2.52	+11.25	− 5.70	312 13 53.88	+ 4 19.86	− 1 1.8	18 12 8.07	− 0.27	3 23 33.1	+ 1.5
	42	51 Cephei, S. P. .	5	42 30.68	−14.75	− 5.70	306 3 59.68	+ 4 58.56	− 1 17.0	6 42 10.23	− 0.11	357 14 2.4	+ 3.2
	43	Pallas . . .	9	5 48.40	− 0.12	− 5.70	17 52 3.65	+ 7 16.32	+ 18.0	19 5 42.58	. .	69 5 59.2	− 1.0
	44	γ Aquilæ (R.) . .	.	. . .	. .	. .	151 22 0.05	+ 3 46.76	− 30.8	. . . .	. .	79 41 5.3	+ 0.7
	45	γ Aquilæ . . .	.	. . .	. .	. .	28 29 59.60	+ 4 14.88	+ 30.8	. . . .	. .	79 41 6.5	+ 1.9
	46	Ariadne . . .	9	26 38.63	− 0.52	− 5.70	53 44 0.88	+ 7 30.75	+ 1 17.0	20 26 32.41	. .	104 59 9.8	− 8.4
	47	Groom. 3241 .	5	30 38.68	+ 1.57	− 5.70	320 43 58.78	+ 3 27.57	− 37.0	20 30 34.55	+ 0.04	17 53 10.6	+ 1.5
	48	α Cygni (R.) . .	.	. . .	. .	. .	185 51 53.35	+ 4 52.09	+ 5.9	. . . .	. .	45 9 29.9	− 0.5
	49	α Cygni . . .	.	. . .	. .	. .	353 58 0.80	+ 5 15.38	− 5.9	. . . .	. .	45 9 31.5	+ 1.1
	50	ν Cygni . . .	7	52 43.62	+ 0.18	− **5.64**	358 7 53.70	+ 4 9.29	− 1.8	20 52 38.10	− 0.02	49 18 22.4	+ 4.4

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.14	70.5	68.5
30.01	76.0	73.6
29.99	75.0	73.2
29.97	73.5	71.5
30.12	73.5	74.6
30.13	76.5	77.0
30.13	78.5	79.0
30.08	72.5	71.5
30.08	71.5	70.0
30.06	68.6	67.0

For summary of the elements of reduction see page 3.

6, 7, 16, 27, 33, 45. One bisection.
8, 11, 41, 42. Five bisections.
35, 37. Four bisections.

ZENITH-POINT CORR.

	″
No. 1 to 2	+ 59.58
No. 4 to 17	+ 59.93
No. 18 to 26	+ 59.15
No. 27 to 50	+ 59.05

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
6	− 1.8	− 22.2	. .	− 24.0
7	− 1.8	+ 22.2	. .	+ 20.4
25	− 2.6	− 15 46.6	. .	− 15 49.2
26	− 2.5	+ 15 46.6	. .	+ 15 44.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
July 12	1	61¹ Cygni . . .	6	1 31.74	+ 0.13	− **5.71**	0 40 1.40	+ 4 50.37	+ 0.7	21 1 26.17	0.00	51 51 13.7	+
F.	2	61² Cygni . . .	5	1 33.23	+ 0.13	− 5.70	0 40 1.40	+ 4 59.60	+ 0.7	21 1 27.66	− 2.88	51 51 22.9	+ 1
	3	ζ Cygni . . .	9	7 50.80	− 0.01	− **5.74**	9 5 57.62	+ 4 6.24	+ 9.2	21 7 45.09	+ 0.07	60 16 34.3	+ 1
	4	Ceres . . .	9	18 14.87	− 0.67	− 5.70	66 13 54.62	+ 5 49.00	+ 2 8.6	21 18 8.50	. .	117 28 13.4	− 4
S.	5	a Tauri . . .	9	28 58.88	− 0.36	− **5.38**	22 33 59.45	+ 3 29.43	+ 23.3	4 28 53.17	+ 0.02	73 44 13.4	+ 3
	6	a Aurigæ . . .	8	7 42.84	− 0.20	− **5.33**	352 57 56.58	+ 3 31.85	− 6.8	5 7 37.69	+ 0.07	44 7 42.8	+ 1
	7	β Tauri . . .	9	18 37.82	− 0.17	− **5.35**	10 17 56.25	+ 5 20.79	+ 10.2	5 18 32.29	0.00	61 29 48.4	+ 1.
13	8	Sun I, N. . .	7	31 11.49	− 0.24	− 5.39	16 47 56.22	+ 3 52.16	+ 16.6	7 31 5.86	+68.08	67 58 26.2	.
	9	Sun II, S. . .	9	33 27. 6	− 0.24	− 5.39	17 20 1.15	+ 3 17.32	+ 17.2	7 33 22.03	−68.09	68 29 56.9	.
	10	a Hydræ . . .	8	21 39.42	− 0.60	− **5.41**	46 56 . .	. . .	. .	9 21 33.43	0.00	. . . .	.
	11	β Libræ . . .	9	10 32.26	− 0.69	− **5.37**	47 43 59.40	+ 4 34.47	+ 1 1.2	15 10 26.26	+ 0.06	98 55 56.3	+ 2.
	12	μ¹ Bootis . . .	9	19 58.71	− 0.06	− **5.29**	0 59 58.42	+ 5 9.92	+ 1.1	15 19 53.33	− 0.07	52 11 30.6	+ 3.
	13	a Cor. Borealis .	9	29 37.07	− 0.24	− **5.24**	11 41 56.48	+ 3 49.79	+ 11.6	15 29 31.51	− 0.07	62 52 19.1	+ 2.
	14	a Serpentis . .	9	38 21.30	− 0.50	− **5.32**	32 0 1.18	+ 4 23.96	+ 34.9	15 38 15.48	+ 0.03	83 11 21.2	+ 2
	15	ε Serpentis . .	9	44 49.91	− 0.52	− **5.34**	33 57 56.45	+ 4 19.13	+ 37.6	15 44 44.07	+ 0.01	85 9 14.4	+ 2.
	16	a Ophiuchi . .	9	29 22.43	− 0.41	− 5.35	26 10 . .	. . .	. .	17 29 16.67	+ 0.01	. . . .	.
	17	μ Sagittarii . .	9	6 34.50	− 0.81	− 5.36	59 54 . .	. . .	. .	18 6 28.33	0.00	. . . .	.
	18	δ Ursæ Minoris .	5	12 1.36	+12.56	− 5.36	312 14 . .	. . .	. .	18 12 8.56	+ 0.41	. . . .	.
	19	η Serpentis . .	9	15 6.18	− 0.59	− 5.36	41 43 59.22	+ 4 41.65	+ 50.2	18 15 0.22	+ 0.11	92 55 52.3	+ 4.
	20	ι Aquilæ . . .	9	28 40.48	− 0.65	− 5.36	47 7 57.92	+ 4 29.41	+ 1 0.6	18 28 34.46	+ 0.08	98 19 49.1	+ 4.
	21	γ Aquilæ . . .	9	40 33.87	− 0.41	− **5.41**	28 30 3.02	+ 4 13.66	+ 30.7	19 40 28.07	+ 0.05	79 41 8.6	+ 4.
	22	a Aquilæ . . .	9	44 56.11	− 0.42	− **5.40**	30 16 . .	. . .	. .	19 44 50.30	+ 0.05	. . . .	.
	23	λ Ursæ Minoris .	4	46 53.35	+42.04	− 5.40	309 54 . .	. . .	. .	19 47 29.99	− 2.15	. . . .	.
	24	τ Aquilæ . . .	9	58 17.01	− 0.45	− **5.31**	31 52 . .	. . .	. .	19 58 11.16	− 0.04	. . . .	.
	25	a² Capricorni . .	9	11 23.68	− 0.69	− **5.47**	51 44 . .	. . .	. .	20 11 17.59	+ 0.13	. . . .	.
	26	π Capricorni . .	9	20 26.84	− 0.77	− **5.40**	57 24 . .	. . .	. .	20 20 20.67	+ 0.04	. . . .	.
P. 14	27	Juno	9	16 27.40	− 0.62	− 5.72	43 3 55.60	+ 4 45.34	+ 52.2	16 16 21.06	. .	94 15 54.3	− 2.
	28	a Scorpii . . .	9	22 2.27	− 0.90	− **5.77**	64 55 56.50	+ 5 24.93	+ 1 59.0	16 21 55.65	+ 0.03	116 9 41.6	− 0.
	29	ζ Ophiuchi . .	9	30 32.86	− 0.70	− **5.67**	49 7 55.38	+ 3 49.80	+ 1 4.5	16 30 26.45	− 0.04	100 19 10.9	+ 1.
	30	η Herculis . .	9	38 49.34	+ 0.03	− **5.70**	359 39 59.22	+ 4 15.15	− 0.3	16 38 43.66	− 0.01	50 50 35.3	+ 1.
	31	H. IV, 50 . .	9	43 39.70	+ 0.26	− 5.71	351 0 0.18	+ 9 1.85	− 8.7	16 43 34.25	− 2.90	42 15 14.5	− 0.
	32	κ Ophiuchi . .	9	52 0.08	− 0.46	− **5.71**	29 13 54.65	+ 5 16.42	+ 31.3	16 51 53.91	+ 0.07	80 26 3.6	+ 2.
	33	ε Ursæ Minoris .	9	58 43.01	+ 5.38	− 5.71	316 35 54.98	+ 4 23.87	− 52.6	16 58 42.68	− 0.04	7 45 47.4	+ 0.
	34	a¹ Herculis . .	9	9 11.54	− 0.40	− **5.66**	24 15 54.82	+ 5 28.96	+ 25.3	17 9 5.43	− 0.03	75 28 10.3	+ 1.
	35	δ Ursæ Minoris .	5	12 0.92	+12.69	− 5.70	312 13 55.22	+ 4 16.68	− 1 1.5	18 12 7.91	− 0.06	3 23 31.6	+ 0.
	36	a Lyræ. . . .	9	32 55.16	− 0.03	− **5.63**	0 9 57.35	+ 3 28.30	+ 0.2	18 32 49.44	− 0.03	51 19 47.0	− 0.
	37	51 Cephei, s. P. .	5	42 33.54	−16.99	− 5.69	306 3 55.75	+ 4 58.90	− 1 16.7	6 42 10.86	+ 0.14	357 13 59.1	+ 0.
	38	β Lyræ. . . .	9	45 41.19	− 0.14	− **5.62**	5 35 52.22	+ 4 26.13	+ 5.6	18 45 35.36	− 0.03	56 46 45.2	+ 0.
	39	γ Aquilæ . . .	9	40 34.26	− 0.48	− **5.72**	28 29 59.88	+ 4 13.04	+ 30.6	19 40 28.09	+ 0.06	79 41 4.7	+ 0.
	40	a Aquilæ . . .	9	44 56.54	− 0.50	− **5.74**	30 15 55.52	+ 4 25.73	+ 32.9	19 44 50.35	+ 0.09	81 27 15.3	− 0.
	41	λ Ursæ Minoris .	2	46 56.05	+40.96	− 5.69	309 53 58.72	+ 4 40.22	− 1 7.0	19 47 31.32	− 0.68	1 3 53.1	− 0.
	42	τ Aquilæ . . .	9	58 17.54	− 0.55	− **5.72**	31 51 57.08	+ 5 7.98	+ 35.0	19 58 11.30	+ 0.06	83 4 1.3	+ 1.
	43	a² Capricorni . .	9	11 24.06	− 0.78	− **5.76**	51 43 58.90	+ 3 51.07	+ 1 11.4	20 11 17.58	+ 0.12	102 55 22.6	− 0.
	44	Ariadne . . .	9	24 51.92	− 0.80	− 5.70	53 45 57.95	+ 5 6.96	+ 1 16.9	20 24 45.42	. .	104 58 43.0	− 8.
	45	a Cygni . . .	9	37 22.87	+ 0.08	− **5.67**	353 57 54.68	+ 5 20.37	− 5.9	20 37 17.25	+ 0.01	45 9 30.3	+ 0.
	46	μ Aquarii . . .	9	46 11.27	− 0.74	− **5.69**	48 13 56.40	+ 5 7.69	+ 1 3.1	20 46 4.83	+ 0.16	99 26 28.4	+ 0.
	47	ν Cygni . . .	9	52 43.93	− 0.03	− **5.71**	358 7 54.45	+ 4 5.21	− 1.8	20 52 38.19	+ 0.04	49 18 19.1	+ 1.
	48	ζ Cygni . . .	9	7 50.98	− 0.24	− **5.66**	9 5 55.02	+ 4 7.80	+ 9.1	21 7 45.03	+ 0.02	60 16 33.1	+ 0.
	49	Ceres . . .	9	16 52.79	− 0.96	− 5.71	66 27 56.80	+ 5 33.24	+ 2 9.2	21 16 46.12	. .	117 42 0.4	− 4.
E. 15	50	Moon I, N. . .	9	2 48.59	− 0.52	− 5.89	42 25 52.38	+ 5 39 59	+ 49.4	12 2 42.18	+67.12	93 38 42.6	.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	30.08	66.5	64.8
5	30.08	72.9	73.2
9	30.08	80.0	82.0
11	30.01	74.9	74.0
19	30.01	70.8	68.9
27	30.07	74.8	73.8
35	30.06	72.0	70.3
41	30.06	70.0	68.5
49	30.06	70.0	68.5
50	30.02	87.3	90.8

For summary of the elements of reduction see page 3.

19. One bisection.
33, 35, 37, 41, 50. Three bisections.
3. Four bisections.

ZENITH-POINT CORR.

	″
No. 1 to 4	+ 59.05
No. 5 to 9	+ 59.90
No. 11 to 21	+ 59.55
No. 27 to 49	+ 58.21
No. 50	+ 57.96

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
8	− 2.5	+ 15 45.3	. .	+ 15 42.
9	− 2.6	− 15 45.3	. .	− 15 47.
50	−39 51.5	+ 16 10.4	. .	− 23 41.

TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
15	1	η Virginis	9	13 44.87	− 0.50	− **5.81**	38 47 50.15	+ 4 16.20	+ 43.4	12 13 38.48	− 0.09	89 59 11.0	+ 1.2
	2	β Corvi	9	28 4.04	− 0.72	− **5.97**	61 29 58.92	+ 5 19.73	+ 1 39.2	12 27 57.44	+ 0.10	112 43 19.0	+ 2.4
	3	Polaris, s. p.	8	14 17.36	−32.81	− 5.82	307 29 56.62	+ 3 58.23	− 1 10.0	1 13 38.73	− 0.36	358 39 6.0	− 1.8
	4	α Virginis	9	18 51.41	− 0.60	− **5.85**	49 20 0.92	+ 3 57.88	+ 1 2.9	13 18 45.00	+ 0.01	100 31 22.9	0.0
	5	ζ Virginis	9	28 34.07	− 0.50	− **5.81**	38 45 49.45	+ 5 19.99	+ 43.5	13 28 27.77	0.00	89 58 14.1	+ 3.5
	6	η Bootis	9	48 58.02	− 0.28	− **5.72**	19 47 50.15	+ 4 43.75	+ 19.5	13 48 51.97	− 0.09	70 59 14.6	+ 3.0
16	7	α Bootis	9	10 11.52	− 0.11	− **5.95**	18 59 58.20	+ 4 5.60	+ 18.7	14 10 5.49	+ 0.05	70 10 43.7	+ 2.7
	8	ε Bootis	9	39 45.33	− 0.02	− **5.83**	11 13 53.60	+ 4 1.49	+ 10.8	14 39 39.38	− 0.09	62 24 27.1	+ 1.1
	9	α² Libræ	9	44 13.72	− 0.46	− **6.03**	54 20 2.05	+ 4 25.59	+ 1 15.6	14 44 7.33	+ 0.10	105 32 4.4	+ 1.7
	10	β Ursæ Minoris	5	51 11.78	+ 1.99	− 5.93	324 9 52.40	+ 4 54.01	− 39.1	14 51 7.84	− 0.04	15 20 28.5	− 0.3
	11	β Bootis	8	57 27.10	+ 0.16	− **5.87**	357 55 57.22	+ 5 9.01	− 1.9	14 57 21.32	− 0.04	49 7 25.5	+ 0.5
	12	β Libræ	9	10 32.53	− 0.40	− **5.95**	47 43 52.45	+ 4 42.86	+ 59.9	15 10 26.19	+ 0.01	98 55 56.4	+ 2.9
	13	α Cor. Borealis	9	29 37.49	− 0.05	− **5.88**	11 42 . .	. . .	. .	15 29 31.49	− 0.06	. . . .	. .
	14	ε Serpentis	9	44 50.30	− 0.28	− **5.99**	33 57 58.15	+ 4 17.57	+ 36.8	15 44 44.06	+ 0.02	85 9 13.7	+ 2.2
	15	ζ Ursæ Minoris	.	. . .	. .	. .	320 40 1.38	+ 4 1.40	− 44.5	. . . .	. .	11 49 39.5	+ 1.2
	16	ε Cor. Borealis	4	52 38.54	− 0.04	− **5.92**	11 34 . .	. . .	. .	15 52 32.54	− 0.08	. . . .	. .
	17	β¹ Scorpii	9	58 27.01	− 0.50	− **6.05**	58 15 52.72	+ 4 37.34	+ 1 28.0	15 58 20.55	+ 0.15	109 28 19.3	+ 1.9
	18	Juno	8	15 51.37	− 0.38	− 5.97	43 9 53.30	+ 5 23.98	+ 51.2	16 15 45.02	. .	94 22 29.7	− 2.3
	19	α Scorpii	9	22 2.27	− 0.57	− **6.11**	64 56 2.38	+ 5 24.97	+ 1 56.1	16 21 55.78	+ 0.12	116 9 44.7	+ 2.9
	20	ε Ursæ Minoris	9	58 43.77	+ 4.31	− 5.99	316 35 52.22	+ 4 25.55	− 51.4	16 58 42.09	− 0.38	7 45 47.6	+ 1.3
	21	α¹ Herculis	9	9 11.61	− 0.19	− **5.95**	24 16 . .	. . .	. .	17 0 5.43	− 0.02	. . . .	. .
	22	Jupiter I, S.	6	40 45.78	− 0.54	− 6.01	61 57 59 65	+ 3 38.42	+ 1 42.5	17 40 39.23	+ 1.72	113 9 41.8	. .
	23	Jupiter II, N.	5	40 49.22	− 0.54	− 6.01	61 57 59.65	+ 2 57.02	+ 1 42.5	17 40 42.67	− 1.72	113 9 0.4	. .
	24	γ² Sagittarii	9	58 5.28	− 0.62	− **6.07**	69 11 51.85	+ 4 57.19	+ 2 23.3	17 57 58.65	+ 0.05	120 25 33.5	− 0.2
	25	μ¹ Sagittarii	9	6 34.94	− 0.53	− **6.04**	59 53 55.88	+ 3 34.90	+ 1 34.4	18 6 28.40	+ 0.06	111 5 26.4	− 0.4
	26	δ Ursæ Minoris	5	12 3.86	+10.33	− 6.02	312 13 53.90	+ 4 15.66	− 1 0.2	18 12 8.17	+ 0.55	3 23 30.6	+ 0.1
	27	ι Aquilæ	9	28 40.88	− 0.43	− **5.98**	47 7 54.22	+ 4 31.44	+ 59.2	18 28 34.42	+ 0.03	98 19 46.1	+ 1.6
	28	α Lyræ	9	32 55.34	+ 0.07	− **5.90**	0 9 51.88	+ 3 32.38	+ 0.2	18 32 49.38	− 0.10	51 19 45.7	− 1.2
	29	51 Cephei, s. p.	5	42 31.28	−13.67	− 6.03	306 3 53.52	+ 4 59.93	− 1 15.0	6 42 11.58	+ 0.52	357 13 59.6	+ 1.4
	30	d Sagittarii	9	10 36.79	− 0.53	− **6.04**	57 58 2.12	+ 4 21.82	+ 1 28.0	19 10 30.21	+ 0.01	109 10 13.1	+ 4.2
	31	δ Aquilæ	3	19 27.69	− 0.34	− **6.06**	35 55 58.48	+ 4 44.57	+ 40.0	19 19 21.30	+ 0.08	87 7 44.2	+ 1.9
24	32	μ¹ Sagittarii	9	6 37.30	− 0.51	− **8.41**	59 54 . .	. . .	. .	18 6 28.45	+ 0.10	. . . .	. .
	33	δ Ursæ Minoris	5	12 4.98	+ 8.93	− 8.34	312 14 . .	. . .	. .	18 12 5.57	− 0.12	. . . .	. .
	34	α Lyræ	9	32 57.70	+ 0.04	− **8.27**	0 10 . .	. . .	. .	18 32 49.40	− 0.04	. . . .	. .
26	35	κ Ophiuchi	9	52 3.33	− 0.20	− **9.29**	29 13 53.68	+ 5 17.83	+ 30.5	16 51 53.83	+ 0.06	80 26 3.2	+ 3.4
	36	ε Ursæ Minoris	9	58 46.81	+ 3.60	− 9.30	316 35 51.85	+ 4 24.49	− 51.2	16 58 41.11	− 0.01	7 45 46.3	+ 2.0
	37	α¹ Herculis	9	9 14.82	− 0.16	− **9.25**	24 15 53.02	+ 5 30.83	+ 24.6	17 9 5.36	− 0.03	75 28 9.6	+ 2.5
	38	44 Ophiuchi	9	19 5.10	− 0.41	− **9.35**	62 51 58.92	+ 3 42.24	+ 1 46.0	17 18 55.38	+ 0.07	114 3 48.4	+ 2.4
	39	Groom. 966, s. p.	9	23 30.58	− 2.48	− 9.31	293 49 57.90	+ 3 11.97	− 2 2.2	5 23 18.79	− 0.57	344 57 28.9	+ 2.2
	40	α Ophiuchi	8	29 26.21	− 0.17	− **9.39**	26 9 55.70	+ 4 16.87	+ 26.8	17 29 16.73	+ 0.12	77 21 0.6	+ 2.5
	41	Jupiter I, N.	8	37 6.22	− 0.41	− 9.31	61 55 57.30	+ 4 42.47	+ 1 42.1	17 36 56.50	+ 1.64	113 8 43.1	. .
	42	Jupiter II, S.	6	37 9.49	− 0.41	− 9.31	61 55 57.30	+ 5 25.06	+ 1 42.1	17 36 59.77	− 1.63	113 9 25.7	. .
	43	μ Herculis	9	41 51.03	− 0.05	− **9.26**	11 1 56.32	+ 3 55.18	+ 10.7	17 41 41.67	− 0.01	62 12 23.4	+ 2.4
	44	γ² Sagittarii	9	58 8.37	− 0.46	− **9.32**	69 11 57.30	+ 4 52.93	+ 2 22.6	17 57 58.59	− 0.01	120 25 34.0	− 0.2
	45	μ¹ Sagittarii	9	6 38.17	− 0.40	− **9.40**	59 53 57.92	+ 3 34.52	+ 1 34.1	18 6 28.45	+ 0.11	111 5 27.7	+ 0.9
	46	δ Ursæ Minoris	9	12 5.46	+ 8.59	− 9.32	312 13 53.68	+ 4 13.72	− 59.9	18 12 4.73	− 0.45	3 23 28.7	+ 1.1
	47	α Lyræ	9	32 58.70	+ 0.08	− **9.32**	0 9 55.95	+ 3 27.33	+ 0.2	18 32 49.45	+ 0.02	51 19 44.7	+ 0.6

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.02	86.5	89.0
29.93	85.5	86.0
29.93	84.5	84.2
29.94	84.2	83.5
29.94	81.2	80.6
29.92	80.0	78.6
30.01	86.0	85.5
30.01	83.7	83.2

For summary of the elements of reduction see page 3.

3. Three bisections.
6, 9, 10. Four bisections.
26, 29, 46. Five bisections.

ZENITH-POINT CORR.

No. 1 to 6 + ′ 57.″96
No. 7 to 31 + 58.85
No. 35 to 47 + 1 0.54

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
22	− 1.8	− 20.7	. .	− 22.5
23	− 1.8	+ 20.7	. .	+ 18.9
41	− 1.8	+ 21.3	. .	+ 19.5
42	− 1.8	− 21.3	. .	− 23.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
July 26	1	51 Cephei, S. P.	9	42 34.79	−11.41	− 9.33	306 3 56.35	+ 4 53.56	− 1 14.7	6 42 14.05	+ 0.24	357 13 56.4	− 1
P.	2	β Lyræ	9	45 44.68	0.00	− **9.26**	5 36 . .	. .	. .	18 45 35.35	− 0.03	. . . .	.
	3	B. A. C. 6690	6	25 58.22	− 0.06	− 9.35	11 7 53.65	+ 3 21.87	+ 10.8	19 25 48.81	− 3.17	62 17 47.5	+ 3
	4	B. A. C. 6691	5	26 0.33	− 0.06	− 9.35	11 7 53.65	+ 3 2.82	+ 10.8	19 26 50.92	− 3.17	62 17 28.5	+ 3
	5	λ Ursæ Minoris	4	47 9.95	+27.78	− 9.35	309 53 56.70	+ 4 37.21	− 1 5.2	19 47 28.38	− 0.05	1 3 49.9	+ 0
	6	ε Delphini (R.)	.	. . .	. .	. .	151 55 52.70	+ 4 14.99	− 29.1	. . . .	. .	79 6 42.6	+ 0
	7	ε Delphini	.	. . .	. .	. .	27 55 56.25	+ 3 56.33	+ 29.1	. . . .	. .	79 6 42.9	+ 1
	8	B. A. C. 7220 (R.)	.	. . .	. .	. .	202 23 54.10	+ 3 49.84	+ 22.7	. . . .	. .	28 38 14.6	+ 3
	9	B. A. C. 7220	6	42 58.93	+ 0.55	− 9.37	337 27 58.50	+ 4 18.99	− 22.7	20 42 50.11	− 3.01	28 38 16.0	+ 3
	10	ζ Cygni (R.)	.	. . .	. .	. .	170 45 51.80	+ 4 9.35	− 8.8	. . . .	. .	60 16 28.8	− 0
	11	ζ Cygni	2	7 54.40	− 0.06	− 9.38	9 5 57.15	+ 4 2.91	+ 8.8	21 7 44.96	− 0.28	60 16 30.1	+ 1
	12	α Cephei (R.)	.	. . .	. .	. .	203 5 52.38	+ 4 3.14	+ 23.5	. . . .	. .	27 56 2.2	− 2
	13	α Cephei	7	15 50.34	+ 0.56	− 9.38	336 45 57.35	+ 4 9.40	− 23.5	21 15 41.54	+ 0.05	27 56 4.5	− 0
	14	β Aquarii	9	25 18.34	− 0.33	− **9.36**	44 53 57.62	+ 5 15.98	+ 54.8	21 25 8.63	− 0.01	96 6 29.6	+ 2
	15	ξ Aquarii	9	31 25.66	− 0.34	− **9.41**	47 11 56.88	+ 4 48.02	+ 59.3	21 31 15.94	+ 0.09	98 24 5.4	+ 1
	16	ε Pegasi	9	38 21 67	− 0.23	− **9.36**	29 29 59.62	+ 4 15.56	+ 31.1	21 38 12.05	− 0.03	80 41 7.5	+ 2
	17	μ Capricorni	9	46 48.91	− 0.38	− **9.41**	52 55 58.02	+ 4 1.37	+ 1 12.7	21 46 39.14	+ 0.02	104 7 33.3	+ 2
	18	Moon II, N.	9	53 55.67	− 0.38	− 9.39	52 44 0.02	+ 4 18.08	+ 1 12.2	21 53 45.90	−62.54	103 55 51.5	.
	19	α Aquarii	9	59 41.13	− 0.30	− **9.39**	39 43 58.02	+ 3 42.18	+ 45.7	21 59 31.44	+ 0.02	90 54 47.1	+ 1
F. 27	20	μ Geminorum	6	15 42.19	− 0.15	− **9.38**	16 13 57.18	+ 4 48.34	+ 16.0	6 15 32.66	− 0.02	67 25 22.7	+ 0
	21	γ Geminorum	9	30 47.36	− 0.22	− **9.38**	22 17 56.68	+ 5 3.70	+ 22.5	6 30 37.74	− 0.03	73 29 44.1	+ 1
	22	α Canis Majoris	9	39 54.16	− 0.44	− **9.39**	55 20 0.72	+ 5 5.67	+ 1 19.0	6 39 44.33	+ 0.05	106 32 46.6	+ 1
	23	ε Canis Majoris	9	53 57.73	− 0.54	− **9.37**	67 36 0.28	+ 3 33.33	+ 2 11.7	6 53 47.80	− 0.07	118 48 6.5	− 2.
	24	δ Geminorum	9	12 57.54	− 0.15	− **9.44**	16 35 55.52	+ 4 57.92	+ 16.3	7 12 47.99	0.00	67 47 30.9	+ 2.
28	25	Sun I, S.	9	31 8.12	− 0.17	− 9.46	20 11 54.10	+ 4 55.61	+ 20.0	8 30 58.49	+66.93	71 23 30.9	.
	26	Sun II, N.	9	33 21.99	− 0.17	− 9.46	19 39 59.58	+ 5 16.73	− 19.4	8 33 12.36	−66.94	70 51 56.9	.
S. 29	27	π Aquarii	9	19 13.09	− 0.29	− **9.62**	38 4 0.40	+ 3 27.40	+ 43.3	22 19 3.15	0.00	89 14 32.3	+ 1.
	28	9 Draconis, S. P.	9	24 48.88	− 2.55	− 9.65	295 11 59.50	+ 4 21.59	− 1 56.3	10 24 36.68	− 0.17	346 20 46.0	+ 2.
	29	ζ Pegasi	9	35 32.87	− 0.22	− **9.69**	28 37 59.42	+ 3 32.79	+ 30.2	22 35 22.99	+ 0.12	79 48 23.6	+ 2.
	30	74 Aquarii	9	47 13.72	− 0.39	− 9.67	51 7 58.45	+ 26.35	+ 1 8.4	22 47 3.66	− 3.58	102 15 54.4	+19.
	31	h¹ Aquarii	9	58 58.47	− 0.36	− 9.67	47 12 1.93	+ 1 45.54	+ 59.7	22 58 48.44	− 3.46	98 21 8.4	+19.
	32	Weisse 76	9	6 47.47	− 0.37	− 9.68	49 6 1.52	+ 33.87	+ 1 3.7	23 6 37.42	− 3.45	100 14 0.3	+20.
	33	ψ² Aquarii	9	11 44.11	− 0.37	− 9.68	48 42 3.36	+ 1 26.89	+ 1 2.9	23 11 34.06	− 3.42	99 50 54.3	+20.
	34	Mars I	6	27 6.33	− 0.37	− 9.69	48 35 59.84	+ 2 2.86	+ 1 2.7	23 26 56.27	+ 0.71	99 45 26.6	.
	35	Mars II	5	27 7.84	− 0.37	− 9.69	48 36 . .	. .	. .	23 26 57.78	− 0.80	. . . .	.
	36	B. A. C. 8239	9	35 0.40	− 0.39	− 9.69	51 12 2.35	+ 1 52.08	+ 1 8.7	23 34 50.32	− 3.35	102 21 24.3	+22.
	37	B. A. C. 8266	9	41 9.22	− 0.39	− 9.70	51 25 59.38	+ 1 37.70	+ 1 9.2	23 40 59.13	− 3.32	102 35 7.5	+22.
	38	B. A. C. 8285	9	44 7.23	− 0.38	− 9.70	49 30 5.82	+ 1 46.05	+ 1 4.7	23 43 57.15	− 3.27	100 39 17.8	+22.
	39	Weisse 985	9	49 40.02	− 0.40	− 9.70	52 40 5.46	+ 2 3.97	+ 1 12.4	23 49 29.92	− 3.29	103 49 43.0	+23.
	40	Moon II, N.	5	5 8.24	− 0.28	− 9.71	35 43 59.98	+ 5 3.06	+ 39.9	0 4 58.25	−66.94	86 56 4.1	.
	41	B. A. C. 79 (R.)	.	. . .	. .	. .	192 21 59.52	+ 4 32.10	+ 12.2	. . . .	. .	38 39 37.4	+ 5.
	42	B. A. C. 79	.	. . .	. .	. .	347 27 58.22	+ 5 32.35	− 12.2	. . . .	. .	38 39 39.6	+ 5.
	43	κ Draconis, S. P.	9	28 26.68	− 1.88	− 9.72	289 19 59.60	+ 4 16.63	− 2 35.3	12 28 15.08	− 0.01	340 28 2.1	+ 1.
	44	β Ceti	9	37 38.08	− 0.43	− **9.70**	57 27 57.72	+ 3 31.59	+ 1 26.6	0 37 27.92	+ 0.03	108 39 17.1	+ 0.
	45	ε Piscium	9	56 46.39	− 0.25	− **9.75**	31 34 1.40	+ 5 5.71	+ 34.1	0 56 36.40	0.00	82 46 2.4	+ 1.
	46	Polaris	7	13 40.46	+21.22	− 9.75	310 10 1.30	+ 5 33.21	− 1 5.2	1 13 51.93	− 0.37	1 20 50.5	+ 0.
	47	θ¹ Ceti	9	18 5.38	− 0.36	− **9.79**	47 27 58.42	+ 3 24.35	+ 1 0.7	1 17 55.27	+ 0.04	98 48 44.7	+ 3.
	48	η Piscium	9	25 6.74	− 0.20	− **9.73**	24 6 0.30	+ 4 17.27	+ 44.8	1 24 56.79	+ 0.06	75 17 3.6	+ 1.
	49	β Arietis	9	48 3.28	− 0.15	− **9.75**	18 35 58.02	+ 4 46.96	+ 18.7	1 47 53.37	+ 0.01	69 47 24.9	+ 2.
P.	50	δ Ursæ Min., S. P.	7	12 23.11	− 8.28	− 10.39	305 27 54.15	+ 3 35.90	− 1 16.2	18 12 4.44	+ 0.10	356 36 35.0	+ 1.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
5	30.01	82.2	81.6
19	30.01	81.8	80.7
20	30.10	83.2	83.8
24	30.10	85.8	86.0
26	30.09	87.8	89.2
27	29.84	75.8	74.5
33	29.85	75.3	74.0
44	29.84	75.3	74.1
49	29.86	74.9	73.3
50	29.92	82.0	82.7

For summary of the elements of reduction see page 3.

1, 18, 40, 50. Three bisections.
5. Five bisections.

ZENITH-POINT CORR.

		′ ″
No. 1 to 19	+	1 0.54
No. 20 to 26	+	59.62
No. 27 to 49	+	1 0.69
No. 50	+	1 3.25

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
18	−42 51.5	+ 14 44.6	. .	− 28 6.
25	− 3.0	− 15 47.0	. .	− 15 50.
26	− 3.0	+ 15 47.0	. .	+ 15 44.
34	− 14.6	. . .	+ 0.2	− 14.
40	−31 44.9	+ 14 53.8	. .	− 16 51.

ATE ND S'R.	Number	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
y 29	1	γ Geminorum	9	30 48.14	− 0.07	− **10.28**	22 17 54.10	+ 5 6.96	+ 22.4	6 30 37.68	− 0.14	73 29 44.7	+ 2.5
P.	2	α Canis Majoris	9	39 55.04	− 0.26	− **10 41**	55 19 59.45	+ 5 7.83	+ 1 18.7	6 39 44.39	+ 0.07	106 32 47.2	+ 2.0
	3	51 Cephei	2	42 16.75	+ 9.51	− 10.39	311 36 . .	. . .	. .	6 42′15.87	+ 1.17	. . . .	. .
	4	ε Canis Majoris	8	53 58.56	− 0.32	− **10.38**	67 35 56.45	+ 3 39.18	+ 2 11.3	6 53 47.85	− 0.06	118 48 8.1	− 0.7
	5	δ Canis Majoris	9	3 34.66	− 0.31	− **10.55**	64 59 59.18	+ 3 30.64	+ 1 56.1	7 3 23.96	+ 0.11	116 11 47.1	+ 3.0
	6	B. A. C. 2326	3	5 13.72	+ 3.48	− 10.40	316 11 54.28	+ 4 10.03	− 51.9	7 5 6.80	− 2.82	7 21 33.6	− 2.3
	7	δ Geminorum	9	12 58.36	− 0.03	− **10.34**	16 35 55.38	+ 4 57.87	+ 16.3	7 12 47.93	− 0.10	67 47 30.7	+ 2.1
	8	B. A. C. 2819	6	20 13.43	+ 0.61	− 10.41	337 41 58.10	+ 4 25.95	− 22.1	8 20 3.63	− 1.64	28 52 23.1	+ 0.2
30	9	Sun I, S.	9	38 58.00	− 0.04	− 10.41	20 41 57.45	+ 3 36.41	+ 20.5	8 38 47.55	. .	71 52 15.6	. .
	10	Sun II, N.	9	41 11.31	− 0.04	− 10.41	20 9 56.48	+ 4 5.13	+ 20.0	8 41 0.86	. .	71 20 42.8	. .
	11	ι Draconis	9	19 32.16	+ 3.24	− 10.41	316 57 55.38	+ 4 33.10	− 50.2	9 19 24.99	+ 0.13	8 7 59.5	+ 2.0
	12	Mercury I, S.	6	27 16.08	− 0.03	− 10.42	22 1 56.55	+ 4 3.30	+ 21.9	9 27 5.63	. .	73 12 42.9	. .
	13	Mercury II, N.	5	27 16.40	− 0.03	− 10.42	22 1 56.55	+ 3 59.12	+ 21.9	9 27. 5.95	. .	73 12 38.8	. .
	14	B. A. C. 3346	9	42 25.16	+ 0.60	− 10.42	339 11 54.65	+ 5 7.01	− 20.4	9 42 15.34	− 1.59	30 23 2.5	+ 0.5
	15	Venus I, S.	6	12 32.65	− 0.06	− 10.42	26 5 56.92	+ 3 53.00	+ 26.5	10 12 22.17	. .	77 16 51.6	. .
	16	Venus II, N.	5	12 33.34	− 0.06	− 10.42	26 5 56.92	+ 3 41.57	+ 26.5	10 12 22.86	. .	77 16 26.2	. .
	17	30 (H.) Camelop.	2	16 1.33	+ 3.97	− 10.42	315 40 0.05	+ 3 33.84	− 52.5	10 15 54.88	− 0.27	6 49 2.6	0.0
	18	α Ursæ Maj. (R.)	.	. . .	. .	. .	203 25 52.10	+ 4 59.80	+ 23.4	. . . . .	. .	27 35 5.9	− 1.3
	19	α Ursæ Majoris	5	56 18.65	+ 0.70	− 10.43	336 23 54.02	+ 5 15.78	− 23.4	10 56 8.92	− 0.02	27 35 7.6	+ 0.4
	20	δ Leonis	9	7 45.82	0.00	− **10.35**	17 37 54.70	+ 3 40.70	+ 17.2	11 7 35.39	− 0.13	68 48 13.8	+ 1.4
	21	δ Crateris	7	13 23.38	− 0.22	− **10.47**	52 55 55.78	+ 3 31.15	+ 1 11.3	11 13 12.73	+ 0.04	104 6 59.4	+ 1.2
	22	λ Draconis	9	24 15.71	+ 1.15	− 10.43	328 49 58.15	+ 3 36.36	− 32.5	11 24 6.43	+ 0.10	19 59 23.2	− 2.0
	23	β Leonis	9	42 59.20	− 0.03	− **10.48**	23 33 53.58	+ 3 54.22	+ 24.6	11 42 48.73	+ 0.03	74 44 32.6	+ 2.6
	24	H. IV, 50	6	43 44.36	+ 0.08	− 10.53	351 3 52.85	+ 5 4.44	− 8.5	16 43 33.91	− 2.60	42 15 10.0	+ 2.8
	25	ε Ursæ Minoris	5	58 47.87	+ 3.27	− 10.53	316 35 53.70	+ 4 21.21	− 51.7	16 58 40.61	+ 0.08	7 45 44.4	+ 0.7
	26	B. A. C. 5793	9	5 13.71	− 0.36	− 10.53	71 3 56.55	+ 4 29.82	+ 2 39.0	17 5 2.82	− 3.88	122 17 26.6	−15.2
	27	α¹ Herculis	9	9 15.99	− 0.07	− **10.55**	24 15 52.28	+ 5 29.78	+ 24.8	17 9 5.39	+ 0 04	75 28 8.1	+ 1.6
	28	Anonymous	7	16 35.27	− 0.16	− 10.53	36 11 55.18	+ 1 26.68	+ 40.2	17 16 24.58	− 3.19	87 20 23.3	− 5.1
	29	Anonymous	7	16 41.23	− 0.16	− 10.53	36 11 55.18	+ 3 54.97	+ 40.3	17 16 30.54	− 3.19	87 22 51.7	− 5.1
	30	Groom. 966, S. P.	5	23 31.82	− 2.11	− 10.53	293 49 56.60	+ 3 12.10	− 2 3.2	5 23 19.18	− 0.52	344 57 26.7	+ 0.6
	31	Durch. 16°, 3211¹	6	26 45.47	− 0.07	− 10.53	22 23 53.78	+ 5 13.87	+ 22.7	17 26 34.87	− 3.04	73 35 51.5	− 1.5
	32	Durch. 16°, 3211²	5	26 46.32	− 0.07	− 10.53	22 23 53.78	+ 5 1.04	+ 22.7	17 26 35.72	− 3.04	73 35 38.7	− 1.5
	33	Weisse (2) 817	9	28 22.92	[illegible] 0.07	− 10.53	22 23 53.78	+ 5 2.58	+ 22.7	17 28 12.32	− 3.05	73 35 40.3	− 1.4
	34	O. Arg. S. 17137	9	37 18.49	[illegible]33	− 10.53	66 0 . .	. . .	. .	17 37 7.63	− 3.93	. . . .	. .
	35	Anonymous	3	37 24.63	− [illegible]33	− 10.53	66 0 . .	. . .	. .	17 37 13.77	− 3.93	. . . .	. .
	36	O. Arg. S. 17166	8	38 23.08	− 0.33	− 10.53	66 0 . .	. . .	. .	17 38 12.22	− 3.94	. . . .	. .
	37	μ Herculis	8	41 52.16	− 0.03	− **10.45**	11 1 55.45	+ 3 53.92	+ 10.8	17 41 41.60	− 0.04	62 12 21.4	+ 1.2
	38	B. A. C. 6072	9	51 5.89	− 0.34	− 10.53	67 31 57.40	+ 4 15.93	+ 2 12.5	17 50 55.02	− 4.06	118 44 47.0	−10.1
	39	γ² Sagittarii	9	58 9.52	− 0.35	− **10.60**	69 11 56.15	+ 4 52.26	+ 2 24.2	17 57 58.64	+ 0.06	120 25 33.8	− 0.6
	40	22 Camelop., S. P.	9	5 31.70	− 1.60	− 10.54	288 13 54.60	+ 4 2.66	− 2 44.6	6 5 19.56	+ 0.45	339 21 33.9	+ 0.5
	41	δ Ursæ Minoris	5	12 6.60	+ 7.64	− 10.54	312 13 53.22	+ 4 13.08	− 1 0.4	18 12 3.70	− 0.52	3 23 27.1	− 0.4
	42	η Serpentis	9	15 10.99	− 0.19	− **10.57**	41 43 55.42	+ 4 42.78	+ 49.2	18 15 0.26	+ 0.13	92 55 48.6	+ 2.4
	43	B. A. C. 6298, N.	6	25 9.73	− 0.40	− 10.54	77 33 54.72	+ 4 11.47	+ 4 5.0	18 24 58.79	− 4.66	128 48 32.4	− 8.5
	44	B. A. C. 6298, S.	5	25 9.77	− 0.40	− 10.54	77 33 54.72	+ 4 32.19	+ 4 5.1	18 24 58.83	− 4.66	128 48 53.2	− 8.5
	45	α Lyræ	9	32 59.80	+ 0.13	− **10.49**	0 9 55.95	+ 3 25.63	+ 0.2	18 32 49.39	− 0.02	51 19 43.0	− 0.1
	46	β Lyræ	9	45 45.88	+ 0.07	− **10.55**	5 35 52.32	− 4 22.79	+ 5.5	10 45 35.41	+ 0.05	56 46 41.8	+ 1.2
	47	Pallas	9	52 28.70	− 0.07	− 10.54	20 1 56.18	+ 3 42.74	+ 20.2	18 52 18.09	. .	71 12 20.3	− 1.1
	48	B. A. C. 6520	9	58 10.91	+ 0.22	− 10.54	352 3 56.85	+ 4 5.10	− 7.6	18 58 0.59	− 2.94	43 14 15.6	+ 4.7
	49	B. A. C. 2439, S. P.	9	18 17.61	− 1.53	− 10.54	287 35 53.10	+ 3 24.95	− 2 51.2	7 18 5.54	− 1.73	338 42 48.0	+ 0.8
	50	Anonymous	5	30 17.07	− 0.35	− 10.54	65 21 58.85	+ 51.51	+ 1 59.6	19 30 6.18	− 4.33	116 31 11.2	+ 0.9

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.92	83.7	84.2
29.93	85.8	86.5
29.92	86.5	87.5
29.92	87.8	88.2
29.91	88.2	88.5
29.90	87.5	88.8
29.93	79.4	79.4
29.93	77.5	77.3

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

8. One bisection. No. 1 to 23 + 63″.25

11, 25, 30, 40, 41, 43, 49. Three bisections. No. 24 to 50 + 62.31

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
9	− 3.1	− 15 46.4	. .	− 15 49.5
10	− 3.0	+ 15 46.4	. .	+ 15 43.4
12	− 2.5	− 2.1	+ 0.1	− 4.4
13	− 2.5	+ 2.1	. .	− 0.3
15	− 2.5	− 5.7	+ 0.0	− 8.2
16	− 2.5	+ 5.7	. .	+ 3.2

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
July 30 S.	1	Anonymous	5	31 7.95	− 0.35	− 10.54	65 21 58.85	+ 8 1.95	+ 2 0.3	19 30 57.06	− 4.34	116 38 22.3	+ 1
	2	B. A. C. 6763¹	6	38 46.02	+ 0.27	− 10.54	348 35 52.35	+ 3 27.62	− 11.1	19 38 35.75	− 2.98	39 45 30.1	+ 5
	3	B. A. C. 6763²	5	38 48.75	+ 0.27	− 10.54	348 35 52.35	+ 3 54.42	− 11.1	19 38 38.48	− 2.98	39 45 56.9	+ 5
	4	λ Ursæ Minoris	5	47 12.00	+24.11	− 10.54	309 53 53.95	+ 4 38.72	− 1 5.7	19 47 25.57	− 1.38	1 3 48.2	+ 0
	5	Anonymous	9	5 4.47	− 0.35	− 10.55	66 11 57.55	+ 5 4.89	+ 2 4.8	20 4 53.57	− 4.40	117 25 28.4	+ 4
	6	Ariadne	9	9 44.29	− 0.28	− 10.55	53 53 54.78	+ 5 16.07	+ 1 15.8	20 9 33.46	. .	105 6 47.8	− 8
	7	Themis (?)	5	15 38.32	− 0.32	− 10.55	59 45 56.02	+ 4 39.03	+ 1 34.7	20 15 27.45	. .	110 58 30.9	− 3
	8	ε Delphini (R.)	.	. . .	. .	. .	151 55 54.42	+ 4 14.08	− 29.4	. . . .	. .	79 6 42.1	+ 1
	9	ε Delphini	3	27 34.36	− 0.14	− **10.55**	27 55 56.80	+ 3 54.96	+ 29.4	20 27 23.67	+ 0.06	79 6 42.4	+ 1
	10	α Cygni	9	37 27.82	+ 0.17	− **10.56**	353 57 54.02	+ 5 15.88	− 5.8	20 37 17.44	+ 0.05	45 9 25.3	+ 1
	11	B. A. C. 7220 (R.)	.	. . .	. .	. .	202 23 54.68	+ 3 50.72	+ 22.8	. . . .	. .	28 38 13.0	+ 4
	12	B. A. C. 7220	5	43 0.31	+ 0.52	− 10.55	337 27 56.75	+ 4 19.70	− 22.8	20 42 50.28	− 3.03	28 38 14.8	+ 4
	13	Ceres	9	3 52.33	− 0.37	− 10.56	68 11 56.90	+ 4 41.90	+ 2 17.6	21 3 41.40	. .	119 25 17.6	− 4
	14	ζ Cygni	9	7 55.86	− 0.01	− **10.54**	9 5 52.90	+ 4 6.16	+ 8.9	21 7 45.28	0.00	60 16 29.2	+ 1
	15	74 Aquarii	9	47 14.71	− 0.28	− 10.63	51 7 55.12	+ 29.37	+ 1 8.7	22 47 3.80	− 3.60	102 15 54.4	+19
	16	h¹ Aquarii	9	58 59.42	− 0.26	− 10.64	47 11 55.86	+ 1 51.13	+ 59.9	22 58 48.52	− 3.48	98 21 8.1	+19
	17	Weisse 76	9	6 48.44	− 0.27	− 10.65	49 5 56.25	+ 38.29	+ 1 4.0	23 6 37.52	− 3.48	100 13 59.7	+20
	18	ψ² Aquarii	9	11 45.07	− 0.27	− 10.65	48 41 57.48	+ 1 33.20	+ 1 3.2	23 11 34.15	− 3.45	99 50 55.0	+20
	19	Anonymous	9	20 24.97	− 0.26	− 10.66	46 21 56.65	+ 4 59.01	+ 58.3	23 20 14.05	− 3.37	97 34 15.2	+20
	20	Mars I, C.	6	27 30.45	− 0.27	− 10.66	48 35 54.29	+ 2 45.31	+ 1 3.0	23 27 19.52	. .	99 46 3.8	.
	21	Mars II	5	27 31.98	− 0.27	− 10.66	48 36 . .	. .	. .	23 27 21.05	. .	. . . .	.
	22	B. A. C. 8239	9	35 1.33	− 0.27	− 10.67	51 11 55.18	+ 1 59.37	+ 1 9.0	23 34 50.39	− 3.37	102 21 24.8	+22
	23	B. A. C. 8266	9	41 10.13	− 0.27	− 10.67	51 25 57.75	+ 1 38.00	+ 1 9.6	23 40 59.19	− 3.34	102 35 6.6	+22
	24	B. A. C. 8285	9	44 8.16	− 0.26	− 10.67	49 30 0.35	+ 1 49.95	+ 1 5.0	23 43 57.23	− 3.30	100 39 16.5	+22
	25	Weisse 985	9	. . .	. .	. .	52 40 1.84	+ 2 7.20	+ 1 12.8	. . . .	. .	103 49 43.0	+23
	26	α Andromedæ	9	2 15.46	− 0.01	− **10.59**	10 23 54.90	+ 4 41.80	+ 10.3	0 2 4.77	− 0.06	61 35 8.2	+ 1
	27	γ Pegasi	9	7 7.97	− 0.12	− **10.72**	24 17 54.75	+ 5 5.89	+ 25.2	0 6 57.16	0.00	75 29 47.0	+ 2
	28	B. A. C. 4165, S.P.	4	14 40.45	−15.98	− 10.69	307 13 55.30	+ 3 52.18	− 1 12.9	12 14 13.78	+ 5.96	358 22 55.8	− 1.
	29	12 Ceti (R.)	.	. . .	. .	. .	136 23 55.42	+ 5 27.25	− 52.7	. . . .	. .	94 37 51.2	+22.
	30	12 Ceti	3	23 59 61	− 0.23	− 10.70	43 25 58.02	+ 4 40.34	+ 52.7	0 23 48.68	− 3.02	94 37 52.3	+22.
	31	α Cassiopeæ, (R.)	.	. . .	. .	. .	196 53 53.95	+ 3 59.63	+ 17.0	. . . .	. .	34 8 10.6	− 0.
	32	α Cassiopeæ	6	33 45.16	+ 0.37	− 10.71	342 57 57.20	+ 4 10.99	− 17.0	0 33 34.82	− 0.28	34 8 12.4	+ 1.
	33	β Ceti	9	37 39.00	− 0.31	− **10.71**	57 27 55.40	+ 3 34.29	+ 1 27.1	0 37 27.98	+ 0.06	108 39 18.0	+ 1.
	34	Moon II, N.	9	49 35.37	− 0.16	− 10.72	29 55 56.10	+ 4 4.64	+ 32.1	0 49 24.49	−62.75	81 6 54.0	.
	35	Piscium	9	56 47.31	− 0.16	− **10.73**	31 33 57.22	+ 5 9.55	+ 34.3	0 56 36.43	0.00	82 46 2.3	+ 1.
	36	β Andromedæ	9	3 4.22	+ 0.05	− 10.73	3 51 55.50	+ 3 25.29	+ 3.8	1 2 53.54	− 2.71	55 1 45.8	+10.
	37	Polaris	5	13 43.64	+18.55	− 10.73	310 9 58.80	+ 5 36.94	− 1 5.6	1 13 51.46	− 1.74	1 20 51.3	+ 1.
	38	θ¹ Ceti	9	18 6.29	− 0.25	− **10.78**	47 37 56.75	+ 3 24.00	+ 1 1.1	1 17 55.30	+ 0.04	98 48 43.1	+ 2.
Aug. 3 P.	39	γ Ceti	9	37 10.64	− 0.63	− **11.93**	36 5 58.98	+ 3 37.82	+ 41.0	2 36 58.07	− 0.02	87 16 39.0	− 0.
	40	α Ceti	9	56 5.90	− 0.62	− **11.94**	35 11 57.05	+ 4 19.86	+ 39.7	2 55 53.35	+ 0.02	86 23 17.8	+ 0.
	41	η Tauri	9	40 24 99	− 0.34	− **11.94**	15 5 55.40	+ 3 52.65	+ 15.2	3 40 12.73	+ 0.03	66 16 24.4	+ 1.
	42	ζ Persei	9	46 38.57	− 0.20	− **11.92**	7 17 55.78	+ 4 26.37	+ 7.2	3 46 26.46	+ 0.03	58 28 50.6	+ 0.
	43	γ¹ Eridani	9	52 32.02	− 0.84	− **11.89**	52 40 4.38	+ 3 31.19	+ 1 13.4	3 52 19.27	+ 0.01	103 51 10.2	+ 1.
	44	γ Tauri	9	13 2.07	− 0.45	− **11.90**	23 27 56.22	+ 5 20.30	+ 24.4	4 12 49.72	+ 0.02	74 40 2.1	+ 2.
	45	Moon II, N.	9	22 18.18	− 0.28	− 11.90	11 55 58.40	+ 4 59.56	+ 11.9	4 22 6.00	−74.38	63 7 31.1	. .
	46	α Tauri	9	29 6.12	− 0.44	− **11.89**	22 33 59.22	+ 3 25.92	+ 23.3	4 28 53.78	− 0.02	73 44 9.6	+ 1.
	47	ι Aurigæ	9	49 13.24	− 0.16	− **11.90**	5 49 59.20	+ 5 16.74	+ 5.8	4 49 1.19	+ 0.03	57 1 42.9	+ 1.
	48	ε Ursæ Min., S P.	7	58 58.54	− 6.94	− 11.89	301 5 58.30	+ 3 30.86	− 1 32.0	16 58 39.71	− 0.14	352 14 18.4	+ 1.
S. 6	49	ζ Pegasi	.	. . .	. .	. .	28 38 1.60	+ 3 30.47	+ 30.5	. . . .	. .	79 48 23.8	+ 3.
	50	74 Aquarii	.	. . .	. .	. .	51 7 59.64	+ 23.55	+ 1 9.1	. . . .	. .	102 15 53.5	+19.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
13	29.92	76.8	75.2
15	29.94	75.3	73.7
25	29.94	74.6	72.9
38	29.96	73.7	72.3
39	29.96	69.0	68.2
41	29.98	70.2	69.7
48	29.99	72.2	71.6
49	29.88	72.6	69.8

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

4. Five bisections. No. 1 to 38 + 62″.31

15, 16, 17, 18, 20, 22, 23, 24, 25, 27, 38, 50. } Four bisections. No. 39 to 48 + 61.06

28, 34, 37. Three bisections. No. 49 to 50 + 62.36

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 14.8	. .	+ 0.2	− 14.
34	−27 19.5	+ 15 1.4	. .	− 12 18.
45	−11 55.6	+ 15 54.1	. .	+ 3 58.

DATE AND OBS'R.	Number	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
July 29	1	γ Geminorum. .	9	30 48.14	− 0.07	**− 10.28**	22 17 54.10	+ 5 6.96	+ 22.4	6 30 37.68	− 0.14	73 29 44.7	+ 2.5
P.	2	α Canis Majoris .	9	39 55.04	− 0.26	**− 10.41**	55 19 59.45	+ 5 7.83	+ 1 18.7	6 39 44.39	+ 0.07	106 32 47.2	+ 2.0
	3	51 Cephei . . .	2	42 16.75	+ 9.51	− 10.39	311 36 . .	. . .	. .	6 42 15.87	+ 1.17	. . . .	. .
	4	ε Canis Majoris .	8	53 58.56	− 0.32	**− 10.38**	67 35 56.45	+ 3 39.18	+ 2 11.3	6 53 47.85	− 0.06	118 48 8.1	− 0.7
	5	δ Canis Majoris .	9	3 34.66	− 0.31	**− 10.55**	64 59 59.18	+ 3 30.64	+ 1 56.1	7 3 23.96	+ 0.11	116 11 47.1	+ 3.0
	6	B. A. C. 2326 .	3	5 13.72	+ 3.48	− 10.40	316 11 54.28	+ 4 10.03	− 51.9	7 5 6.80	− 2.82	7 21 33.6	− 2.3
	7	δ Geminorum. .	9	12 58.36	− 0.03	**− 10.34**	16 35 55.38	+ 4 57.87	+ 16.3	7 12 47.93	− 0.10	67 47 30.7	+ 2.1
	8	B. A. C. 2819 .	6	20 13.43	+ 0.61	− 10.41	337 41 58.10	+ 4 25.95	− 22.1	8 20 3.63	− 1.64	28 52 23.1	+ 0.2
30	9	Sun I, S.. . .	9	38 58.00	− 0.04	− 10.41	20 41 57.45	+ 3 36.41	+ 20.5	8 38 47.55	. .	71 52 15.6	. .
	10	Sun II, N. . .	9	41 11.31	− 0.04	− 10.41	20 9 56.48	+ 4 5.13	+ 20.0	8 41 0.86	. .	71 20 42.8	. .
	11	ι Draconis . .	9	19 32.16	+ 3.24	− 10.41	316 57 55.38	+ 4 33.10	− 50.2	9 19 24.99	+ 0.13	8 7 59.5	+ 2.0
	12	Mercury I, S. .	6	27 16.08	− 0.03	− 10.42	22 1 56.55	+ 4 3.30	+ 21.9	9 27 5.63	. .	73 12 42.9	. .
	13	Mercury II, N. .	5	27 16.40	− 0.03	− 10.42	22 1 56.55	+ 3 59.12	+ 21.9	9 27 5.95	. .	73 12 38.8	. .
	14	B. A. C. 3346 .	9	42 25.16	+ 0.60	− 10.42	339 11 54.65	+ 5 7.01	− 20.4	9 42 15.34	− 1.59	30 23 2.5	+ 0.5
	15	Venus I, S. . .	6	12 32.65	− 0.06	− 10.42	26 5 56.92	+ 3 53.00	+ 26.5	10 12 22.17	. .	77 16 51.6	. .
	16	Venus II, N. .	5	12 33.34	− 0.06	− 10.42	26 5 56.92	+ 3 41.57	+ 26.5	10 12 22.86	. .	77 16 26.2	. .
	17	30 (H.) Camelop. .	2	16 1.33	+ 3.97	− 10.42	315 40 0.05	+ 3 33.84	− 52.5	10 15 54.88	− 0.27	6 49 2.6	0.0
	18	α Ursæ Maj. (R.) .	.	. . .	. .	. .	203 25 52.10	+ 4 59.80	+ 23.4	. . . .	. .	27 35 5.9	− 1.3
	19	α Ursæ Majoris .	5	56 18.65	+ 0.70	− 10.43	336 23 54.02	+ 5 15.78	− 23.4	10 56 8.92	− 0.02	27 35 7.6	+ 0.4
	20	δ Leonis . . .	9	7 45.82	0.00	**− 10.35**	17 37 54.70	+ 3 40.70	+ 17.2	11 7 35.39	− 0.13	68 48 13.8	+ 1.4
	21	δ Crateris . . .	7	13 23.38	− 0.22	**− 10.47**	52 55 55.78	+ 3 31.15	+ 1 11.3	11 13 12.73	+ 0.04	104 6 59.4	+ 1.2
	22	λ Draconis . .	9	24 15.71	+ 1.15	− 10.43	328 49 58.15	+ 3 36.36	− 32.5	11 24 6.43	+ 0.10	19 59 23.2	− 2.0
	23	β Leonis . . .	9	42 59.20	− 0.03	**− 10.48**	23 33 53.58	+ 3 54.22	+ 23.6	11 42 48.73	+ 0.03	74 44 32.6	+ 2.6
	24	H. IV, 50 . .	6	43 44.36	+ 0.08	− 10.53	351 3 52.85	+ 5 4.44	− 8.5	16 43 33.91	− 2.60	42 15 10.0	+ 2.8
	25	ε Ursæ Minoris .	5	58 47.87	+ 3.27	− 10.53	316 35 53.70	+ 4 21.21	− 51.7	16 58 40.61	+ 0.08	7 45 44.4	+ 0.7
	26	B. A. C. 5793 .	9	5 13.71	− 0.36	− 10.53	71 3 56.55	+ 4 29.82	+ 2 39.0	17 5 2.82	− 3.88	122 17 26.6	− 15.2
	27	α^1 Herculis . .	9	9 15.99	− 0.07	**− 10.55**	24 15 52.28	+ 5 29.78	+ 24.8	17 9 5.39	+ 0.04	75 28 8.1	+ 1.6
	28	Anonymous .	7	16 35.27	− 0.16	− 10.53	36 11 55.18	+ 1 26.68	+ 40.2	17 16 24.58	− 3.19	87 20 23.3	− 5.1
	29	Anonymous .	7	16 41.23	− 0.16	− 10.53	36 11 55.18	+ 3 54.97	+ 40.3	17 16 30.54	− 3.19	87 22 51.7	− 5.1
	30	Groom. 966, S. P.	5	23 31.82	− 2.11	− 10.53	293 49 56.60	+ 3 12.10	− 2 3.2	5 23 19.18	− 0.52	344 57 26.7	+ 0.6
	31	Durch. 16°, 3211^1	6	26 45.47	− 0.07	− 10.53	22 23 53.78	+ 5 13.87	+ 22.7	17 26 34.87	− 3.04	73 35 51.5	− 1.5
	32	Durch. 16°, 3211^2	5	26 46.32	− 0.07	− 10.53	22 23 53.78	+ 5 1.04	+ 22.7	17 26 35.72	− 3.04	73 35 38.7	− 1.5
	33	Weisse (2) 817 .	9	28 22.92	− 0.07	− 10.53	22 23 53.78	+ 5 2.58	+ 22.7	17 28 12.32	− 3.05	73 35 40.3	− 1.4
	34	O. Arg. S. 17137.	9	37 18.49	− 0.33	− 10.53	66 0 . .	. . .	. .	17 37 7.63	− 3.93	. . . .	. .
	35	Anonymous .	3	37 24.63	− 0.33	− 10.53	66 0 . .	. . .	. .	17 37 13.77	− 3.93	. . . .	. .
	36	O. Arg. S. 17166.	8	38 23.08	− 0.33	− 10.53	66 0 . .	. . .	. .	17 38 12.22	− 3.94	. . . .	. .
	37	μ Herculis . .	8	41 52.16	− 0.03	**− 10.45**	11 1 55.45	+ 3 53.92	+ 10.8	17 41 41.60	− 0.04	62 12 21.4	+ 1.2
	38	B. A. C. 6072 .	9	51 5.89	− 0.34	− 10.53	67 31 57.40	+ 4 15.93	+ 2 12.5	17 50 55.02	− 4.06	118 44 47.0	− 10.1
	39	γ^2 Sagittarii . .	9	58 9.52	− 0.35	**− 10.60**	69 11 56.15	+ 4 52.26	+ 2 24.2	17 57 58.64	+ 0.06	120 25 33.8	− 0.6
	40	22 Camelop., S. P. .	9	5 31.70	− 1.60	− 10.54	288 13 54.60	+ 4 2.66	− 2 44.6	6 5 19.56	+ 0.45	339 21 33.9	+ 0.5
	41	δ Ursæ Minoris .	5	12 6.60	+ 7.64	− 10.54	312 13 53.22	+ 4 13.08	− 1 0.4	18 12 3.70	− 0.52	3 23 27.1	− 0.4
	42	η Serpentis . .	9	15 10.99	− 0.19	**− 10.57**	41 43 55.42	+ 4 42.78	+ 49.2	18 15 0.26	+ 0.13	92 55 48.6	+ 2.4
	43	B. A. C. 6298, N. .	6	25 9.73	− 0.40	− 10.54	77 33 54.72	+ 4 11.47	+ 4 5.0	18 24 58.79	− 4.66	128 48 32.4	− 8.5
	44	B. A. C. 6298, S. .	5	25 9.77	− 0.40	− 10.54	77 33 54.72	+ 4 32.19	+ 4 5.1	18 24 58.83	− 4.66	128 48 53.2	− 8.5
	45	α Lyræ. . . .	9	32 59.80	+ 0.13	**− 10.49**	0 9 55.95	+ 3 25.63	+ 0.2	18 32 49.39	− 0.02	51 19 43.0	− 0.1
	46	β Lyræ. . . .	9	45 45.88	+ 0.07	**− 10.55**	5 35 52.32	− 4 22.79	+ 5.5	10 45 35.41	+ 0.05	56 46 41.8	+ 1.2
	47	Pallas . . .	9	52 28.70	− 0.07	− 10.54	20 1 56.18	+ 3 42.74	+ 20.2	18 52 18.09	. .	71 12 20.3	− 1.1
	48	B. A. C. 6520 .	9	58 10.91	+ 0.22	− 10.54	352 3 56.85	+ 4 5.10	− 7.6	18 58 0.59	− 2.94	43 14 15.6	+ 4.7
	49	B. A. C. 2439, S.P.	9	18 17.61	− 1.53	− 10.54	287 35 53.10	+ 3 24.95	− 2 51.2	7 18 5.54	− 1.73	338 42 48.0	+ 0.8
	50	Anonymous .	5	30 17.07	− 0.35	− 10.54	65 21 58.85	+ 51.51	+ 1 59.6	19 30 6.18	− 4.33	116 31 11.2	+ 0.9

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
6	29.92	83.7	84.2
10	29.93	85.8	86.5
13	29.92	86.5	87.5
17	29.92	87.8	88.2
19	29.91	88.2	88.5
23	29.90	87.5	88.8
25	29.93	79.4	79.4
41	29.93	77.5	77.3

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

8. One bisection. No. 1 to 23 + 63.″25

11, 25, 30, 40, 41, 43, 49. Three bisections. No. 24 to 50 + 62.31

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
9	− 3.1	− 15 46.4	. .	− 15 49.5
10	− 3.0	+ 15 46.4	. .	+ 15 43.4
12	− 2.5	− 2.1	+ 0.1	− 4.4
13	− 2.5	+ 2.1	. .	− 0.3
15	− 2.5	− 5.7	+ 0.0	− 8.2
16	− 2.5	+ 5.7	. .	+ 3.2

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Aug. 11	1	α^2 Capricorni	9	11 33.14	− 0.89	− **14.49**	51 44 . .	. . .	. .	20 11 17.78	+ 0.08	. . . .	.
E.	2	π Capricorni	9	20 36.41	− 0.97	− **14.48**	57 23 56.40	+ 4 57.82	+ 1 27.6	20 20 20.97	+ 0.05	108 36 43.0	+ 2
	3	ε Delphini	9	27 38.80	− 0.56	− **14.52**	27 55 55.52	+ 3 54.05	+ 29.8	20 27 23.78	+ 0.12	79 6 40.6	− 1
	4	α Cygni	9	37 31.70	+ 0.13	− **14.37**	353 57 54.95	+ 5 11.17	− 5.8	20 37 17.37	− 0.05	45 9 21.5	+ 1
15	5	α^2 Geminorum	9	27 2.99	− 0.07	− **16.01**	6 40 1.10	+ 4 6.15	+ 6.5	7 26 46.92	+ 0.31	57 50 34 9	− 0
	6	α Canis Minoris	9	33 9.64	− 0.46	− **16.01**	33 15 50.08	+ 4 46.89	+ 36.4	7 32 53.18	− 0.09	84 27 34.6	− 0
	7	β Geminorum	9	38 5.17	− 0.14	− **15.98**	10 29 53.50	+ 4 17.15	+ 10.3	7 37 49.03	− 0.04	61 40 42.1	+ 2
17	8	Moon I, N.	9	12 36.38	− 1.07	− 16.16	67 25 58.10	+ 5 46.94	+ 2 13.8	17 12 19.15	+71.35	118 40 20.0	.
S.	9	α Ophiuchi	9	29 33.08	− 0.44	− **16.20**	26 9 59.80	+ 4 9.81	+ 27.5	17 29 16.47	+ 0.07	77 20 58.3	+ 2
	10	Jupiter I, S.	6	33 15.73	− 0.98	− 16.17	62 0 4.20	+ 2 17.79	+ 1 44 6	17 32 58.58	. .	113 10 27.8	.
	11	Jupiter II, N.	5	33 18.84	− 0.98	− 16.17	62 0 4.20	+ 1 36.01	+ 1 44.6	17 33 1.69	. .	113 9 46.0	.
	12	μ Herculis	9	41 57.71	− 0.18	− **16.08**	11 2 0.20	+ 3 47.17	+ 10.9	17 41 41.36	− 0.05	62 12 19.5	+ 2
	13	γ^2 Sagittarii	9	58 15.76	− 1.10	− **16.23**	69 11 59.30	+ 4 48.37	+ 2 26.3	17 57 58.48	+ 0.04	120 25 35.2	0
	14	μ^1 Sagittarii	8	6 45.46	− 0.94	− **16.27**	59 54 1.75	+ 3 28.58	+ 1 36.2	18 6 28.34	+ 0.12	111 5 27.7	+ 0
	15	δ Ursæ Minoris	4	11 59.00	+15.82	− 16.18	312 14 3.80	+ 3 59.54	− 1 1.3	18 11 58.64	+ 0.28	3 23 23.2	+ 0
	16	ι Aquilæ	9	28 51.41	− 0.75	− **16.26**	47 7 58.88	+ 4 23.87	+ 1 0.3	18 28 34.48	+ 0.16	98 19 44.3	+ 1
	17	α Lyræ	9	33 5.23	+ 0.08	− **16.10**	0 10 3.65	+ 3 14.05	+ 0.2	18 32 49.12	− 0.06	51 19 39.1	0
	18	51 Cephei, S. P.	5	42 59.38	−21.11	− 16.19	306 3 52.50	+ 4 54.97	− 1 16.4	6 42 22.08	+ 0.50	357 13 52.3	+ 2
	19	ζ Aquilæ	9	0 5.27	− 0.42	− **16.18**	25 7 47.78	+ 4 28.38	+ 26.3	18 59 48.66	+ 0.10	76 19 3.7	+ 5
	20	μ Aquarii	9	46 22.10	− 0.77	− **16.24**	48 13 53.40	+ 5 9.48	+ 1 3.0	20 46 5.10	+ 0.08	99 26 27.1	+ 2.
	21	β Aquarii	9	25 25.82	− 0.72	− **16.21**	44 53 55.62	+ 5 14.67	+ 56.2	21 25 8.86	− 0.02	96 6 27.7	+ 2.
	22	ζ Aquarii	9	31 33.17	− 0.75	− **16.25**	47 11 55.62	+ 4 46.43	+ 1 0.9	21 31 16.18	+ 0.07	98 24 4.1	+ 2.
	23	ε Pegasi	9	38 28.99	− 0.49	− **16.17**	29 29 51.58	+ 4 19.81	+ 32.0	21 38 12.26	− 0.07	80 41 4.6	+ 3.
	24	μ Capricorni	9	46 56.57	− 0.83	− **16.32**	52 55 55.18	+ 4 0.92	+ 1 14.6	21 46 39.49	+ 0.07	104 7 31.9	+ 2.
	25	79 Draconis	7	51 37.50	+ 2.51	− 16.25	325 41 51.65	+ 5 2.79	− 38.3	21 51 23.76	+ 0.17	16 52 37.3	+ 0.
	26	α Aquarii	9	59 48.69	− 0.63	− **16.31**	39 43 51.88	+ 3 4.43	+ 46.9	21 59 31.81	+ 0.08	96 54 44.3	+ 1.
18	27	Jupiter N.	.	. . .	. .	. .	61 58 4.60	+ 3 43.00	+ 1 44.3	. . . .	. .	113 9 53.1	.
F.	28	Jupiter S.	.	. . .	. .	. .	61 58 4.60	+ 4 23.48	+ 1 44.4	. . . .	. .	113 10 33.7	.
	29	μ^1 Sagittarii	8	6 45.91	− 0.90	− 16.68	59 54 7.45	+ 3 23.52	+ 1 36.0	18 6 28.33	+ 0.12	111 5 28.2	+ 1.
	30	Moon I, S.	9	10 18.30	− 1.03	− 16.68	67 51 59.05	+ 3 45.97	+ 2 16.5	18 10 0.59	+70.56	119 4 22.7	.
	31	B. A. C. 6275	3	22 19.18	− 1.12	− 16.68	71 50 2.50	+ 8 27.03	+ 2 49.4	18 22 1.38	− 4.25	123 7 40.1	− 8.
	32	B. A. C. 6285	9	23 22.83	− 1.11	− 16.68	71 50 2.50	+ 5 1.78	+ 2 48.9	18 23 5.04	− 4.26	123 4 14.4	− 8.
	33	Anonymous	9	24 41.88	− 1.12	− 16.68	71 50 2.50	+ 2 21.07	+ 2 48.5	18 24 24.08	− 4.26	123 1 33.3	− 8.
	34	B. A. C. 6305	3	26 15.88	− 1.12	− 16.68	71 50 2.50	+ 8 30.50	+ 2 49.4	18 25 58.08	− 4.28	123 7 43.6	− 8.
	35	B. A. C. 6308	5	26 23.49	− 1.12	− 16.68	71 50 2.50	+ 4 13.77	+ 2 48.8	18 26 5.69	− 4.28	123 3 26.3	− 8.
	36	B. A. C. 6344	9	31 48.94	− 1.12	− 16.68	71 50 2.50	+ 6 53.25	+ 2 49.2	18 31 31.14	− 4.31	123 6 6.2	− 7.
	37	51 Cephei, S. P.	5	42 55.40	−21.33	− 16.68	306 4 0.02	+ 4 46.96	− 1 16.2	6 42 17.39	− 4.65	357 13 52.0	+ 2.
	38	ζ Aquilæ	3	0 5.72	− 0.40	− **16.66**	25 7 53.82	+ 4 18.46	+ 26.3	18 59 48.64	+ 0.09	76 18 59.8	+ 1.
	39	d Sagittarii	9	10 47.91	− 0.90	− **16.74**	57 58 4.22	+ 4 19.16	+ 1 29.3	19 10 30.32	+ 0.08	109 10 13.9	+ 5.
	40	δ Aquilæ	9	19 38.51	− 0.57	− **16.63**	35 56 1.70	+ 4 36.01	+ 40.6	19 19 21.25	+ 0.01	87 7 39.5	+ 1.
	41	κ Aquilæ	8	30 37.59	− 0.71	− **16.69**	46 5 58.72	+ 4 34.70	+ 58.2	19 30 20.19	+ 0.04	97 17 52.8	+ 1.
	42	α Aquilæ	9	45 7.52	− 0.48	− **16.62**	30 15 59.15	+ 4 17.43	+ 32.8	19 44 50.35	− 0.03	81 27 10.6	+ 0.
	43	λ Ursæ Minoris	4	46 38.58	+52.17	− 16.69	309 54 . .	. . .	. .	19 47 14.06	− 0.45	. . . .	.
	44	α Cygni	9	37 33.73	+ 0.25	− **16.55**	353 58 3.20	+ 5 0.15	− 5.8	20 37 17.29	− 0.10	45 9 18.8	+ 0.
	45	ζ Cygni	9	8 2.19	− 0.15	− **16.62**	9 5 55.22	+ 3 57.15	+ 9.1	21 7 45.35	− 0.04	60 16 22.7	+ 0.
	46	α Cephei	9	15 57.36	+ 1.07	− 16.69	336 45 55.90	+ 4 3.12	− 24.1	21 15 41.74	+ 0.06	27 55 56.1	− 0.
	47	β Aquarii	9	25 26.40	− 0.72	− **16.78**	44 54 2.60	+ 5 6.47	+ 56.2	21 25 8.99	+ 0.10	96 6 26.5	+ 1.
	48	ξ Aquarii	9	31 33.64	− 0.76	− **16.70**	47 11 59.55	+ 4 41.69	+ 1 0.9	21 31 16.19	+ 0.07	98 24 3:3	+ 1.
	49	ε Pegasi	9	38 29.51	− 0.51	− **16.66**	29 30 0.65	+ 4 8.44	+ 32.0	21 38 12 31	− 0.03	80 41 2.3	+ 1.
	50	μ Capricorni	3	46 57.06	− 0.84	− **16.79**	52 56 4.40	+ 3 48.90	+ 1 14.7	21 46 39.53	+ 0.10	104 7 29.2	− 0.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	30.10	73.0	71.5
5	29.88	74.0	74.5
8	30.04	73.9	73.1
19	29.96	71.6	69.5
20	29.98	70.0	68.0
25	29.99	69.1	66.8
26	. .	. .	66.6
27	30.04	75.0	73.6
37	30.05	73.5	72.5
45	30.06	70.5	69.0

For summary of the elements of reduction see page 3.

14, 29, 34, 35. One bisection.
8, 18, 30. Three bisections.
2. Four bisections.
37. Five bisections.

ZENITH-POINT CORR.

No. 1 to 4 + 61″.22
No. 5 to 7 + 61.52
No. 8 to 26 + 60.79
No. 27 to 30 + 60.24

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
8	−51 5.4	+15 7.9	. .	− 35 57
10	− 1.7	− 20.9	. .	− 22
11	− 1.7	+ 20.9	. .	+ 19
27	− 1.7	+ 20.3	. .	+ 18
28	− 1.7	− 20.3	. .	− 22
30	−50 44.4	− 14 59.1	. .	− 1 5 43

ATE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
g. 18	1	α Aquarii . . .	9	59 49.17	− 0.66	**− 16.75**	39 44 2.70	+ 3 33.05	+ 47.0	21 59 31.82	+ 0.0[illegible]	90 54 44.0	+ 1.4
F.	2	ζ Pegasi . . .	8	35 40.43	− 0.50	**− 16.65**	28 38 0.48	+ 3 24.87	+ 30.9	22 35 23.24	+ 0.05	79 48 17.5	− 0.1
	3	74 Aquarii . . .	9	47 21.47	− 0.83	− 16.69	51 7 57.95	+ 22.46	+ 1 9.9	22 47 3.95	− 3.94	102 15 51.5	+20.7
	4	λ¹ Aquarii . . .	9	59 6.21	− 0.79	− 16.69	47 11 58.04	+ 1 44.06	+ 1 0.9	22 58 48.73	− 3.83	98 21 4.6	+21.2
	5	Weisse 76 . .	9	6 55.31	− 0.81	− 16.69	49 5 58.48	+ 32.89	+ 1 5.1	23 6 37.81	− 3.84	100 13 57.7	+21.9
	6	ψ² Aquarii . . .	9	11 51.93	− 0.81	− 16.69	48 41 57.24	+ 1 28.94	+ 1 4.3	23 11 34.43	− 3.82	99 50 51.6	+22.2
	7	Saturn I, N. .	6	21 33.57	− 0.76	− 16.69	45 23 56.70	+ 4 0.68	+ 57.4	23 21 16.12	. .	96 35 15.9	. .
	8	Saturn II, S. .	5	21 34.98	− 0.76	− 16.69	45 23 56.70	+ 4 18.42	+ 57 4	23 21 17.53	. .	96 35 33.7	. .
	9	Mars C. . . .	.	. . .	. .	. .	49 33 58.41	+ 2 4.27	+ 1 6.3	. . . .	. .	100 43 30.2	. .
	10	B. A. C. 8239 .	9	35 8.27	− 0.84	− 16.69	51 12 1.41	+ 1 48.04	+ 1 10.2	23 34 50.74	− 3 79	102 21 20.9	+23.9
	11	B. A. C. 8266 .	9	41 17.12	− 0.84	− 16.69	51 26 1.70	+ 1 29.72	+ 1 10.8	23 40 59.59	− 3.77	102 35 3.4	+24.3
	12	B. A. C. 8285 .	.	. . .	. .	. .	49 29 59.00	+ 1 47.61	+ 1 6.1	. . . .	. .	100 39 13.9	+24.2
	13	Weisse 985 . .	.	. . .	. .	. .	52 40 1.91	+ 2 3.21	+ 1 14.0	. . . .	. .	103 49 40.4	+25.0
	14	α Andromedæ .	9	2 22.04	− 0.23	**− 16.49**	10 23 58.22	+ 4 34.30	+ 10.5	0 2 5.12	− 0.17	61 35 4.2	+ 2.5
	15	γ Pegasi . . .	9	7 14.63	− 0.47	**− 16.54**	24 17 58.25	+ 4 56.33	+ 25.6	0 6 57.47	− 0.14	75 29 41.4	+ 1.2
20	16	γ² Sagittarii . .	9	58 16.24	− 1.12	**− 16.73**	69 11 52.68	+ 4 55.99	+ 2 25.5	17 57 58.47	+ 0.07	120 25 35.4	+ 0.1
S.	17	μ¹ Sagittarii . .	9	6 45.88	− 0.97	**− 16.69**	59 53 53.20	+ 3 38.23	+ 1 35.8	18 6 28.26	+ 0.07	111 5 28.4	+ 1.5
	18	δ Ursæ Minoris .	5	11 56.68	+16.56	− 16.65	312 13 52.60	+ 4 10.16	− 1 1.0	18 11 56.59	− 0.59	3 23 23.0	+ 1.0
	19	η Serpentis . .	9	15 17.40	− 0.69	**− 16 63**	41 43 53.72	+ 4 42.29	+ 49.7	18 15 0.06	+ 0.08	92 55 46.9	+ 2.1
	20	ι Aquilæ . . .	9	28 51.83	− 0.77	**− 16.69**	47 7 50.45	+ 4 33.80	+ 1 0.1	18 28 34.42	+ 0.13	98 19 45.5	+ 2.9
	21	α Lyræ. . . .	9	33 5.62	+ 0.10	**− 16.56**	0 9 50.12	+ 3 28.11	+ 0.2	18 32 49.08	− 0.05	51 19 39.6	+ 1.0
	22	51 Cephei, s. p. .	8	43 1.09	−22.00	− 16.64	306 3 57.05	+ 4 48.62	− 1 16.2	6 42 22.45	− 0.55	357 13 50.7	+ 1.9
	23	β Lyræ. . . .	9	45 51.80	− 0.04	**− 16.57**	5 35 50.25	+ 4 19.66	+ 5.5	18 45 35.12	− 0.03	56 46 36.6	+ 0.4
	24	γ Aquilæ . . .	9	40 45.23	− 0.49	**− 16.60**	28 30 . .	. . .	. .	19 40 28.10	− 0.01	. . . .	. .
	25	α Aquilæ . . .	9	45 7.54	− 0.52	**− 16.61**	30 16 . .	. . .	. .	19 44 50.38	+ 0.01	. . . .	. .
	26	α Cygni . . .	8	37 33.76	+ 0.29	**− 16.63**	353 58 . .	. . .	. .	20 37 17.41	+ 0.03	. . . .	. .
	27	ζ Cygni . . .	9	8 2.17	− 0.12	**− 16.63**	9 5 52.22	+ 4 1.17	+ 9.0	21 7 45.41	+ 0.02	60 16 23.6	+ 1.5
	28	ι Pegasi . . .	.	. . .	. .	. .	19 31 54.22	+ 4 27.53	+ 20.0	. . . .	. .	70 43 3.0	+ 3.8
	29	β Aquarii . . .	9	25 26.31	− 0.75	**− 16.65**	44 53 55.40	+ 5 15.48	+ 56.0	21 25 8.92	+ 0.02	96 6 28.1	+ 3.0
	30	ξ Aquarii . . .	9	31 33.69	− 0.78	**− 16.72**	47 11 50.12	+ 4 46.58	+ 1 0.7	21 31 16.27	+ 0.14	98 24 4.6	+ 2.7
	31	ε Pegasi . . .	9	38 29.51	− 0.51	**− 16.65**	29 29 56.40	+ 4 14.35	+ 31.8	21 38 12.36	+ 0.01	80 41 3.8	+ 3.0
21	32	γ² Sagittarii . .	9	58 16.57	− 1.12	**− 17.07**	69 11 56.38	+ 4 52.31	+ 2 25.9	17 57 58.59	+ 0.20	120 25 35.8	+ 0.4
E.	33	μ Sagittarii . .	9	6 46.08	— 0.97	**− 16.90**	59 53 56.62	+ 3 33.29	+ 1 35.9	18 6 28.25	+ 0.07	111 5 27.0	+ 0.1
	34	δ Ursæ Minoris . .	5	11 57.94	+16.17	− 16.86	312 14 . .	. . .	. .	18 11 57.25	+ 0.46	. . . .	. .
	35	η Serpentis . .	9	15 17.57	− 0.70	**− 16.80**	41 43 54.25	+ 4 41.47	+ 49.8	18 15 0.01	+ 0.04	92 55 46.7	+ 1.9
	36	ι Aquilæ . . .	9	28 52.03	− 0.79	**− 16.88**	47 7 49.88	+ 4 33.45	+ 1 0.1	18 28 34.37	+ 0.09	98 19 44.6	+ 2.1
	37	α Lyræ. . . .	9	33 5.89	+ 0.05	**− 16.80**	0 9 53.10	+ 3 23.65	+ 0.2	18 32 49.07	− 0.04	51 19 38.2	− 0.2
	38	51 Cephei, s. p. . .	7	43 2.73	−21.56	− 16.87	306 3 55.70	+ 4 50.59	− 1 16.2	6 42 24.30	+ 0.84	357 13 51.3	+ 2.7
	39	β Lyræ. . . .	9	45 52.00	− 0.09	**− 16 74**	5 35 49.82	+ 4 20.33	+ 5.5	18 45 35.04	− 0.09	56 46 36.9	+ 0.9
	40	α² Capricorni . .	9	11 35.42	− 0.86	**− 16.80**	51 43 51.70	+ 3 58.90	+ 1 10.9	20 11 17.69	− 0.01	102 55 22.7	+ 1.7
	41	π Capricorni . .	9	20 38.83	− 0.95	**− 16.92**	57 23 55.22	+ 4 58.36	+ 1 27.4	20 20 21.01	+ 0.09	108 36 42.2	+ 1.7
	42	ε Delphini. . .	9	27 41.06	− 0.52	**− 16.82**	27 55 54.62	+ 3 53.90	+ 29.7	20 27 23.67	+ 0.01	79 6 39.4	+ 2.3
	43	α Cygni . . .	9	37 34.08	+ 0.22	**− 16.88**	353 57 48.18	+ 5 15.72	− 5.8	20 37 17.43	+ 0.05	45 9 19.3	+ 1.9
	44	μ Aquarii . . .	9	46 22.81	− 0.81	**− 16.90**	48 13 53.90	+ 5 8.34	+ 1 2.8	20 46 5.13	+ 0.10	99 26 26.2	+ 1.3
	45	Moon I, S. . .	9	49 36.72	− 0.98	− 16.87	59 35 52.35	+ 4 6.14	+ 1 35.3	20 49 18.87	+64.84	110 47 55.0	. .
	46	β Aquarii . . .	9	25 26.58	− 0.77	**− 16.90**	44 53 58.70	+ 5 10.54	+ 55.9	21 25 8.95	+ 0.05	96 6 26.3	+ 1.3
	47	ξ Aquarii . . .	9	31 33.86	− 0.80	**− 16.87**	47 11 55.52	+ 4 46.02	+ 1 0.6	21 31 16.20	+ 0.07	98 24 3.3	+ 1.4
	48	ε Pegasi . . .	.	. . .	. .	. .	29 29 59.30	+ 4 10.99	+ 31.8	. . . .	. .	80 41 3.3	+ 2.6
	49	μ Capricorni . .	9	46 57.24	− 0.88	**− 16.91**	52 55 51.35	+ 4 5.29	+ 1 14.2	21 46 39.51	+ 0.06	104 7 32.0	+ 2.3
	50	Weisse 709 . .	9	35 7.86	− 0.48	− 16.83	24 53 55.85	+ 4 48.52	+ 26.1	22 34 50.55	− 3.58	76 5 31.7	+18.1

Barom.	At. Ther.	Ex. Ther.	*For summary of the elements of reduction see page 3.*		No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
in.	°	°				′ ″	′ ″	′ ″	° ′ ″
30.05	69.5	66.5			7	− 0.7	+ 8.9	. .	+ 8.2
30 05	68.5	67.0			8	− 0.7	− 8.9	. .	− 9.6
30.04	68.4	66.2		ZENITH-POINT CORR.	9	− 17.1	. .	+ 0.0	. .
30.04	67.8	66.2			45	−46 30.1	− 14 45.3	. .	− 1 1 15.3
30.04	67.5	65.8	22, 45. Three bisections.	No. 1 to 15 + 60″.24					
30.03	76.4	74.8		No. 16 to 31 + 60.10					
30.03	74.5	72.3		No. 32 to 50 + 60.15					
30.03	71.1	69.6							
30.03	71.1	69.0							
30.07	76.0	74.0							

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Aug. 21 E.	1	B. A. C. 7931¹ .	6	38 52.15	+ 0.03	− 16.83	359 59 53.50	+ 4 13.14	+ 0.1	22 38 35.35	− 3.40	51 10 27.9	+15
	2	B. A. C. 7931² .	5	38 52.39	+ 0.03	− 16.83	359 59 53.50	+ 4 14.66	+ 0.1	22 38 35 59	− 3.40	51 10 29.5	+15
	3	74 Aquarii . . .	9	47 21.82	− 0.86	− 16.82	51 7 52.72	+ 28.38	+ 1 9.6	22 47 4.14	− 3.98	102 15 51.8	+20
	4	*h*¹ Aquarii . . .	9	59 6.44	− 0.81	− 16.82	47 11 50.61	+ 1 52.61	+ 1 0.6	22 58 48.81	− 3.87	98 21 5.1	+21
	5	Weisse 76 . .	9	6 55.64	− 0.84	− 16.81	49 5 56.15	+ 34.41	+ 1 4.8	23 6 37.99	− 3.89	100 13 56.6	+22
	6	ψ² Aquarii . . .	9	11 52.19	− 0.83	− 16.81	48 41 59.99	+ 1 26.12	+ 1 4.0	23 11 34.55	− 3.87	99 50 51.3	+22
	7	Mars I, C. . .	6	23 5.47	− 0.84	− 16.81	49 47 49.88	+ 2 59.61	+ 1 6.6	23 22 47.82	. .	100 58 17.3	.
	8	Mars II . . .	5	23 7.30	− 0.84	− 16.81	49 48 . .	. . .	. .	23 22 49.65	. .	. . . .	.
	9	B. A. C. 8239 .	9	35 8.49	− 0.87	− 16.80	51 11 54.38	+ 1 55.59	+ 1 9.9	23 34 50.82	− 3.84	102 21 21.1	+24
	10	B. A. C. 8266 .	9	41 17.30	− 0.87	− 16.80	51 25 52.48	+ 1 40.45	+ 1 10.5	23 40 59.63	− 3.82	102 35 4.6	+24
	11	B. A. C. 8285 .	9	44 15.28	− 0.84	− 16.80	49 29 55.00	+ 1 51.62	+ 1 5.8	23 43 57.64	− 3.78	100 39 13.6	+24
	12	Weisse 985 . .	9	49 48.14	− 0.89	− 16.79	52 40 0.50	+ 2 4.98	+ 1 13.7	23 49 30.46	− 3.81	103 49 40.4	+25
	13	ω Piscium . . .	9	53 20.76	− 0.59	− **16.86**	32 37 53.82	+ 3 49.58	+ 36.1	23 53 3.38	+ 0.07	83 48 40.7	− 0
	14	α Andromedæ .	9	2 22.33	− 0.22	− **16.72**	10 23 53.18	+ 4 37.34	+ 10.4	0 2 5.32	− 0.04	61 35 2.1	+ 1
	15	γ Pegasi . . .	9	7 14.94	− 0.47	− **16.79**	24 17 49.15	+ 5 5.92	+ 25.5	0 6 57.68	+ 0.01	75 29 41.8	+ 2
27 S.	16	δ Ursæ Minoris .	5	11 54.70	+16.68	− 16.16	312 13 51.70	+ 4 11.07	− 1 0.9	18 11 55.22	+ 0.57	3 23 23.1	+ 2
	17	ι Aquilæ . . .	9	28 51.26	− 0.75	− **16.21**	47 7 57.62	+ 4 24.97	+ 1 0.0	18 28 34.35	+ 0.13	98 19 43.8	+ 1
	18	α Lyræ	9	33 4.93	+ 0.11	− **16 01**	0 9 58.38	+ 3 17.24	+ 0.2	18 32 48.88	− 0.12	51 19 37.0	− 0
	19	51 Cephei, S. P. .	8	43 5.21	−22.14	− 16.16	306 3 59.15	+ 4 46.05	− 1 16.0	6 42 26.91	+ 0.96	357 13 50.4	− 2
	20	β Lyræ	9	45 51.27	− 0.03	− **16.16**	5 35 56.78	+ 4 12.65	+ 5.5	18 45 35.08	+ 0.04	56 46 36.1	+ 1
	21	ζ Aquilæ . . .	9	0 5 13	− 0.41	− **16.15**	25 7 51.75	+ 4 21.27	+ 26.2	18 59 48.55	+ 0.09	76 19 0.4	+ 3
	22	α Sagittarii . .	9	10 47.38	− 0.91	− **16.27**	57 57 53.82	+ 4 30.29	+ 1 29.1	19 10 30.30	+ 0.13	109 10 14.4	+ 5
	23	δ Aquilæ . . .	9	19 38.01	− 0.58	− **16.19**	35 55 57.60	+ 4 40.52	+ 40.5	19 19 21.26	+ 0.09	87 7 39.8	+ 2
	24	α² Capricorni .	9	11 34.84	− 0.82	− **16.28**	51 43 58.50	+ 3 52.37	+ 1 10.8	20 11 17.85	+ 0.17	102 55 22.9	+ 2
	25	π Capricorni .	8	20 38.06	− 0.91	− **16.20**	57 23 57.72	+ 4 56.25	+ 1 27.3	20 20 20.98	+ 0.07	108 36 42.5	+ 1
	26	ε Delphini . .	6	27 40.24	− 0.47	− **16.06**	27 55 55.38	+ 3 52.17	+ 29.7	20 27 23.60	− 0.05	79 6 38.5	+ 2
	27	α Cygni . . .	7	37 33.25	+ 0.29	− **16.18**	353 57 55.25	+ 5 6.13	− 5.8	20 37 17.37	+ 0.05	45 9 16.8	+ 1
	28	μ Aquarii. . . .	9	46 22.11	− 0.77	− **16.25**	48 13 55.58	+ 5 7.45	+ 1 2.7	20 46 5.17	+ 0.15	99 26 26.9	+ 2
	29	ν Cygni . . .	9	52 54.41	+ 0.15	− **16.16**	358 7 52.02	+ 3 55.59	− 1.8	20 52 38.39	+ 0.03	49 18 7.0	+ 3
	30	61¹ Cygni . . .	9	1 42.54	+ 0.08	− **16.11**	0 40 0.42	+ 4 36.19	+ 0.7	21 1 26.45	− 0.07	51 50 58.5	+ 0
	31	ι Pegasi . . .	9	16 43.83	− 0.33	− **16.13**	19 32 . .	. . .	. .	21 16 27.34	− 0.09	. . . .	.
	32	74 Aquarii . . .	9	47 21.19	− 0.83	− 16.14	51 7 58.00	+ 23.99	+ 1 9.6	22 47 4.22	− 4.04	102 15 52.8	+21
	33	*h*¹ Aquarii . . .	9	59 5.86	− 0.77	− 16.14	47 11 57.85	+ 1 45.11	+ 1 0.7	22 58 48.95	− 3.95	98 21 4.8	+21
	34	Weisse 76 . .	9	6 54.98	− 0.80	− 16.14	49 5 57.85	+ 33.97	+ 1 4.8	23 6 37.94	− 3.97	100 13 57.8	+22
	35	ψ² Aquarii . . .	9	11 51.59	− 0.79	− 16 14	48 42 0.82	+ 1 25.83	+ 1 4.0	23 11 34.66	− 3.95	99 50 51.8	+22
	36	Mars I, C. . .	6	18 1.18	− 0.82	− 16.14	50 20 5.51	+ 1 50.69	+ 1 7.8	23 17 44.22	. .	101 29 25.2	.
	37	Mars II . . .	5	18 3.04	− 0.82	− 16.14	50 20 . .	. . .	. .	23 17 46.08	. .	. . . .	.
	38	B. A. C. 8239 .	9	35 7.93	− 0.83	− 16.13	51 11 55.80	+ 1 55.74	+ 1 9.9	23 34 50.97	− 3.93	102 21 22.7	+24
	39	B. A. C. 8266 .	9	41 16.88	− 0.83	− 16.13	51 25 57.08	+ 1 36.21	+ 1 10.5	23 40 59.92	− 3.92	102 35 5.0	+24
	40	B. A. C. 8285 .	9	44 14.81	− 0.81	− 16.13	49 29 59.32	+ 1 48.34	+ 1 5.8	23 43 57.87	− 3.88	100 39 14.7	+24
	41	Weisse 985 . .	6	49 47.65	− 0.86	− 16.13	52 40 2.52	+ 2 3.61	+ 1 13.7	23 49 30.66	− 3.91	103 49 41.1	+25
	42	α Andromedæ .	9	2 21.77	− 0.17	− **16.10**	10 23 55.10	+ 4 34.54	+ 10.4	0 2 5.47	0.00	61 35 1.2	+ 1
	43	γ Pegasi . . .	9	7 14.37	− 0.43	− **16.15**	24 17 49.65	+ 5 5.41	+ 25.5	0 6 57.82	+ 0.04	75 29 41.8	+ 3
28 E.	44	δ Aquilæ . . .	9	19 38.20	− 0.59	− **16.38**	35 55 51.32	+ 4 46.55	+ 40.2	19 19 21.24	+ 0.08	87 7 39.3	+ 2
	45	κ Aquilæ . . .	9	30 37.30	− 0.73	− **16.45**	46 5 50.48	+ 4 45.25	+ 57.7	19 30 20.20	+ 0.12	97 17 54.6	+ 3
	46	γ Aquilæ . . .	9	40 44.82	− 0.47	− **16.27**	28 29 56.28	+ 4 11.87	+ 30.2	19 40 27.99	− 0.06	79 40 59.6	+ 2
	47	λ Ursæ Minoris .	5	46 27.24	+54.47	− 16.36	309 53 52.65	+ 4 32.48	− 1 6.1	19 47 5.35	− 0.41	1 3 40.2	+ 1
	48	B. A. C. 6905 (R.) .	.	. . .	. .	. .	205 29 54.00	+ 4 51.61	+ 26.6	. . . .	. .	25 31 9.0	+13
	49	B. A. C. 6905 . .	.	. . .	. .	. .	334 21 51.95	+ 3 24.53	− 26.6	. . . .	. .	25 31 11.1	+13
	50	O. Arg. S. 20345	9	8 49.32	− 0.85	− 16.36	53 57 50.55	+ 3 41.04	+ 1 16.3	20 8 32.11	− 4.03	105 9 9.1	+ 6

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
3	30.08	72.0	70.0
7	30.08	71.0	69.0
13	30.07	70.0	69.0
16	30.23	79.9	78.3
23	30.24	76.9	75.8
26	30.24	76.8	75.6
32	30.27	73.8	72.7
43	30.26	72.3	71.6
44	30.21	80.0	79.0

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

47. Three bisections. No. 1 to 15 + 60.″15

3, 4, 5, 6, 7, 9, 10, 11. Four bisections. No. 16 to 43 + 60.76

No. 44 to 50 + 60.21

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	− 17.4	. .	+ 0.0	− 17.
36	− 17.9	. .	− 0.0	− 17.

TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
g. 28	1	O. Arg. S. 20392	9	12 30.01	− 0.84	− 16.35	53 27 49.15	+ 4 52.01	+ 1 15.0	20 12 12.82	− 4.02	104 40 17.4	+ 6.8
C.	2	Lalande 39140	9	16 54.62	− 0.84	− 16.35	53 27 49 15	+ 3 25.63	+ 1 14.9	20 16 37.43	− 4.04	104 38 50.9	+ 7.3
	3	Lalande 39247	9	19 31.33	− 0.86	− 16.35	54 9 55.35	+ 5 4.41	+ 1 17.0	20 19 14.12	− 4.06	105 22 38.0	+ 7.4
	4	Lalande 39486	9	25 23.17	− 0.84	− 16.35	52 59 55.45	+ 3 43.54	+ 1 13.7	20 25 5.98	− 4.04	104 11 13.9	+ 8.2
	5	Lalande 39671^1	6	29 45.72	− 0.86	− 16.35	54 31 54.50	+ 4 19.40	+ 1 18.0	20 29 28.51	− 4.10	105 43 53.1	+ 8.4
	6	Lalande 39671^2	5	29 45.82	− 0.86	− 16.35	54 31 54.50	+ 4 16.56	+ 1 18.0	20 29 28.61	− 4.10	105 43 50.3	+ 8.4
	7	ξ Aquarii (R)	.	. . .	. .	. .	132 37 50.35	+ 5 27.69	− 1 0.2	. . . .	. .	98 24 3.4	+ 1.9
	8	ξ Aquarii	.	. . .	. .	. .	47 11 50.58	+ 4 50.93	+ 1 0.2	. . . .	. .	98 24 2.9	+ 1.4
	9	Tr. Zones 205, 40	9	17 5.26	− 0.87	− 16.32	54 21 55.18	+ 4 5.97	+ 1 17.8	22 16 48.07	− 4.17	105 33 40.2	+18.6
	10	Tr. Zones 204, 17	9	19 44.67	− 0.87	− 16.32	54 21 55.18	+ 4 40.56	+ 1 17.8	22 19 27.48	− 4.17	105 34 14.7	+18.9
	11	Piazzi XXII, 108	9	22 47.32	− 1.39	− 16.32	83 3 52.65	+ 5 1.84	− 10.8	22 22 29.61	− 5.30	134 22 26.5	+17.5
	12	Weisse (2) 698	9	31 56 28	+ 0.21	− 16.32	355 49 52.62	+ 5 47.74	− 4.0	22 31 40.17	− 3.43	47 1 57.5	+17.0
	13	Weisse (2) 715	8	32 24.96	+ 0.21	− 16.31	355 49 52.62	+ 4 8.66	− 4.0	22 32 8.86	− 3.44	47 0 18.5	+16.7
	14	B. A. C. 7931^1	6	38 51.87	+ 0.09	− 16.31	359 59 56.20	+ 4 9.54	+ 0.1	22 38 35.65	− 3.46	51 10 27.0	+17.4
	15	B. A. C. 7931^2	5	38 52.11	+ 0.09	− 16.31	359 59 56.20	+ 4 9.33	+ 0.1	22 38 35.89	− 3.46	51 10 26.8	+17.4
	16	74 Aquarii	9	47 21.38	− 0.82	− 16.31	51 7 50.78	+ 30.87	+ 1 9.1	22 47 4.25	− 4.05	102 15 51.9	+21.1
	17	A^1 Aquarii	9	59 6.04	− 0.76	− 16.31	47 11 51.54	+ 1 52.55	+ 1 0.2	22 58 48.97	− 3.96	98 21 5.5	+21.8
	18	Weisse 76	9	6 55.14	− 0.80	− 16.31	49 5 53 31	+ 38.64	+ 1 4.3	23 6 38.03	− 3.98	100 13 57.5	+22.4
	19	ψ^2 Aquarii	9	11 51.73	− 0.79	− 16.30	48 41 51.12	+ 1 35.74	+ 1 3.4	23 11 34.64	− 3.96	99 50 51.5	+22.8
	20	Mars I, C.	6	17 4.03	− 0.82	− 16.30	50 23 53.01	+ 3 14.46	+ 1 7.5	23 16 46.91	. .	101 34 36.1	. .
	21	Mars II	5	17 5.90	− 0.82	− 16.30	50 24 . .	. . .	. .	23 16 48.78	. .	. . . .	. .
	22	B. A. C. 8239	9	35 8.03	− 0.83	− 16.30	51 11 49.70	+ 2 1.77	+ 1 9.4	23 34 50.90	− 3.95	102 21 22.1	+24.4
	23	B. A. C. 8266	9	41 16.96	− 0.83	− 16.30	51 25 52.95	+ 1 40.88	+ 1 10.0	23 40 59.83	− 3.93	102 35 5.0	+24.8
	24	B. A. C. 8285	9	44 14.93	− 0.80	− 16.29	49 29 55.42	+ 1 52.21	+ 1 5.4	23 43 57.84	− 3.89	100 39 14.2	+24.8
	25	Weisse 985	9	49 47.79	− 0.85	− 16.29	52 39 58.68	+ 2 7.61	+ 1 13.2	23 49 30.65	− 3.92	103 49 40.7	+25.4
	26	ω Piscium	9	53 20.30	− 0.55	− 16.31	32 37 51.00	+ 3 53.56	+ 35.9	23 53 3.46	+ 0.02	83 48 41.7	+ 1.9
	27	α Andromedæ	9	2 21.94	− 0.16	− 16.26	10 23 52.60	+ 4 36.82	+ 10.3	0 2 5.49	0.00	61 35 0.9	+ 1.7
	28	γ Pegasi	9	7 14.53	− 0.42	− 16.30	24 17 49.70	+ 5 5.07	+ 25.3	0 6 57.82	+ 0.02	75 29 41.3	+ 3.0
30	29	β Lyræ	9	45 51.12	− 0.01	− 16.08	5 35 48.30	+ 4 19.70	+ 5 5	18 45 35.05	+ 0.06	56 46 34.7	+ 0.1
	30	ζ Aquilæ	9	0 4.88	− 0.35	− 16.00	25 7 43.70	+ 4 27.26	+ 26.0	18 59 48.47	+ 0.05	76 18 58.2	+ 1.5
	31	d Sagittarii	9	10 47.10	− 0.78	− 16.15	57 57 46.50	+ 4 37.78	+ 1 28.3	19 10 30.25	+ 0.11	109 10 13.8	+ 5.0
	32	δ Aquilæ	9	19 37.78	− 0.49	− 16.08	35 55 50.55	+ 4 47.36	+ 40.2	19 19 21.22	+ 0.08	87 7 39.3	+ 2.1
	33	γ Aquilæ	9	40 44.48	− 0.40	− 16.02	28 29 54.45	+ 4 12.26	+ 30.1	19 40 28.01	− 0.02	79 40 58.0	+ 1.2
	34	λ Ursæ Minoris	5	46 31.28	+48.22	− 16.07	309 54 . .	. . .	. .	19 47 3.43	− 0.44	. . . .	. .
	35	α Cygni	8	37 33.29	+ 0.24	− 16.20	353 57 46.30	+ 5 14.92	− 5.8	20 37 17.44	+ 0.15	45 9 16.6	+ 1.7
	36	μ Aquarii	9	46 22.01	− 0.67	− 16 26	48 13 50.58	+ 5 12.58	+ 1 2.2	20 46 5.25	+ 0.24	99 26 26.6	+ 2.1
	37	ν Cygni	9	52 54.28	+ 0.11	− 16.09	358 7 46.90	+ 3 58.90	− 1.7	20 5 38.30	− 0.04	49 18 5.3	+ 2.5
	38	61^1 Cygni	9	1 42.47	+ 0.05	− 16.02	0 39 54.82	+ 4 41.15	+ 0.7	21 1 26.43	− 0.08	51 50 57.9	+ 0.5
	39	ζ Cygni	9	8 1.50	− 0.13	− 15.97	9 5 49.08	+ 4 1.22	+ 9.0	21 7 45.28	− 0.09	60 16 20.5	+ 0.8
	40	ι Pegasi	9	16 43.74	− 0.30	− 16.08	19 31 50.68	+ 4 27.79	+ 19.8	21 16 27.35	− 0.07	70 42 59.5	+ 2.3
pt. 1	41	κ Aquilæ	9	30 36.80	− 0.79	− 15.93	46 7 17 65	+ 3 17.88	+ 57.4	19 30 20.15	+ 0.11	97 17 54.1	+ 3.0
F.	42	γ Aquilæ	8	40 44.36	− 0.52	− 15.79	28 30 . .	. . .	. .	19 40 27.98	− 0.04	. . . .	. .
	43	α Aquilæ	9	45 6.72	− 0.55	− 15.85	30 16 . .	. . .	. .	19 44 50.31	+ 0.03	. . . .	. .
	44	λ Ursæ Minoris	1	46 22.83	+54.34	− 15.86	309 54 . .	. . .	. .	19 47 1.31	− 0.40	. . . .	. .
	45	61^1 Cygni	9	1 42.26	+ 0.07	− 15.84	0 40 0.40	+ 4 35.12	+ 0.7	21 1 26.47	− 0.03	51 50 57.4	+ 0.5
	46	α Cephei	9	15 56.36	+ 1.13	− 15.86	336 45 57.40	+ 2 56.93	− 23.7	21 15 41.63	+ 0.10	27 55 51.8	− 0.1
	47	β Cephei	7	27 21.06	+ 2.00	− 15.86	328 48 . .	. . .	. .	21 27 7.20	+ 0.23	. . . .	. .
	48	ξ Aquarii	7	31 32.87	− 0.81	− 15.83	47 11 57.30	+ 4 43.04	+ 1 0.0	21 31 16.20	+ 0.03	98 24 1.5	+ 0.2
	49	μ Capricorni	9	46 56.28	− 0.89	− 15.89	52 55 58.32	+ 4 0.31	+ 1 13.6	21 46 39.53	+ 0.03	104 7 33.4	+ 3.8
	50	α Aquarii	9	59 48.43	− 0.69	− 15.90	39 43 55.25	+ 3 41.17	+ 46.2	21 59 31.88	+ 0.06	90 54 43.8	+ 2.5

. Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.17	76.0	75.0
30.14	75.0	73.5
30.07	75.5	78.5
30.06	76.5	75.2
29.82	76.0	74.4
29.84	75.0	72.0

For summary of the elements of reduction see page 3.

14, 49. One bisection.

16, 17, 18, 22, 23, 24, 25, 28. Four bisections.

ZENITH-POINT CORR.

No. 1 to 28 + 60″.21
No. 29 to 40 + 59.94
No. 41 to 50 + 60.74

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	″	′ ″
20	− 17.9	. .	− 0.0	− 17.9

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Sept. 1	1	π Aquarii	.	. .	. .	. .	38 3 58.58	+ 3 23.22	+ 43.6	. . . .	. .	89 14 26.6	+ 0
F.	2	64 Aquarii	9	33 8.42	− 0.84	− 15.85	49 30 3.10	+ 2 12.27	+ 1 5.1	22 32 51.73	− 4.07	100 39 41.7	+20
	3	70 Aquarii	9	42 22.61	− 0.84	− 15.84	50 3 56.39	+ 32.04	+ 1 6.4	22 42 5.93	− 4.07	101 11 56.0	+20
	4	74 Aquarii	9	47 20.91	− 0.85	− 15.84	51 7 56.00	+ 25.26	+ 1 8.9	22 47 4.22	− 4.09	102 15 51.4	+21
	5	B. A. C. 8004	7	53 27.85	− 0.88	− 15.84	52 33 57.05	+ 1 53.99	+ 1 12.6	22 53 11.13	− 4.11	103 43 24.9	+21
	6	α Pegasi	9	58 58.07	− 0.44	− 15.84	24 15 54.72	+ 4 21.41	+ 25.2	22 58 41.79	+ 0.04	75 27 2.5	+ 2
	7	Mars I, C.	6	13 0.53	− 0.86	− 15.83	50 43 56.81	+ 3 18.01	+ 1 8.1	23 12 43.84	. .	101 54 44.1	.
	8	Mars II	5	13 2.44	− 0.86	− 15.83	50 44 . .	. .	. .	23 12 45.75	. .	. . . .	.
	9	Weisse 394	9	21 22.98	− 0.89	− 15.83	52 27 55.52	+ 38.87	+ 1 12.4	23 21 6.26	− 4.06	103 35 57.9	+23
	10	B. A. C. 8199	9	26 10.76	− 0.86	− 15.83	51 3 54.58	+ 1 34.12	+ 1 8.9	23 25 54.07	− 4.02	102 12 58.8	+23
	11	B. A. C. 8221	9	31 37.68	− 0.89	− 15.83	52 35 59.81	+ 31.83	+ 1 12.8	23 31 20.96	− 4.03	103 44 5.6	+24
	12	B. A. C. 8266	9	41 16.53	− 0.86	− 15.83	51 25 57.32	+ 1 35.71	+ 1 9.9	23 40 59.84	− 3.99	102 35 4.1	+24
	13	α Andromedæ	9	2 21.57	− 0.17	− **15.81**	10 23 54.98	+ 4 34.09	+ 10.3	0 2 5.57	+ 0.02	61 35 0.6	+ 2
	14	γ Pegasi	9	7 14.14	− 0.43	− **15.84**	24 17 55.92	+ 4 57.35	+ 25.3	0 6 57.99	+ 0.13	75 29 39.8	+ 2
	15	β Ceti	8	37 45.54	− 0.96	− **1.80**	57 28 . .	. .	. .	0 37 28.77	+ 0.05	. . . .	.
3	16	γ Aquilæ	9	40 44.23	− 0.45	− **15.76**	28 30 3.35	+ 4 1.91	+ 31.1	19 40 28.07	+ 0.08	79 40 57.6	+ 1.
	17	α Aquilæ	8	45 6.52	− 0.49	− **15.74**	30 15 59.72	+ 4 15.82	+ 33.4	19 44 50.32	+ 0.07	81 27 10.1	+ 1.
	18	λ Ursæ Minoris	4	46 17.60	+57.04	− 15.71	309 54 1.20	+ 4 22.40	− 1 8.0	19 46 58.93	− 0.44	1 3 36.8	− 0.
	19	α² Capricorni	9	11 34.42	− 0.84	− **15.88**	51 44 5.38	+ 3 42.54	+ 1 12.4	20 11 17.87	+ 0.23	102 55 21.5	+ 0.
	20	ε Delphini	9	27 39.81	− 0.45	− **15.70**	27 56 1.98	+ 3 44.45	+ 30.4	20 27 23.65	+ 0.05	79 6 38.0	+ 2.
	21	α Cygni	9	37 32.54	+ 0.37	− **15.63**	353 58 4.25	+ 4 55.34	− 6.0	20 37 17.19	− 0.05	45 9 14.8	+ 0.
	22	ν Cygni	5	52 53.74	+ 0.23	− **15.63**	358 7 56.45	+ 3 47.60	− 1.8	20 52 38.25	− 0.05	49 18 3.4	+ 1.
	23	61¹ Cygni	9	1 41.97	+ 0.15	− **15.65**	0 40 1.22	+ 4 34.35	+ 0.7	21 1 26.40	− 0.08	51 50 57.5	+ 1.
	24	ζ Cygni	.	. .	. .	. .	9 5 58.48	+ 3 51.38	+ 9.2	. . . .	. .	60 16 20.3	+ 1.
	25	α Cephei	9	15 55.91	+ 1.30	− 15.72	336 46 1.82	+ 3 51.93	− 24.5	21 15 41.49	− 0.01	27 55 50.5	− 0.
	26	α Aquarii	9	59 48.26	− 0.64	− **15.77**	39 44 3.98	+ 3 29.28	+ 47.6	21 59 31 89	+ 0.06	90 54 42.1	+ 1.
	27	64 Aquarii	9	33 8 37	− 0.82	− 15.73	49 30 6.84	+ 2 5.59	+ 1 7.2	22 32 51.82	− 4.08	100 39 40.9	+20.
	28	70 Aquarii	9	42 22.54	− 0.83	− 15.74	50 4 1.34	+ 24.14	+ 1 8.6	22 42 5.97	− 4.08	101 11 55.2	+20.
	29	74 Aquarii	9	47 20.78	− 0.84	− 15.74	51 7 59.64	+ 18.67	+ 1 11.2	22 47 4.20	− 4.10	102 15 50.7	+21.
	30	B. A. C. 8004	9	53 27.80	− 0.87	− 15.74	52 33 59.64	+ 1 49.08	+ 1 15.0	22 53 11.19	− 4.13	103 43 25.0	+21.
	31	α Pegasi	8	58 57.92	− 0.39	− **15.74**	24 15 51.70	+ 4 22.28	+ 26.0	22 58 41.79	+ 0.02	75 27 1.2	+ 1.
	32	Mars I, C.	6	10 52.82	− 0.84	− 15 74	50 53 59.05	+ 2 38.67	+ 1 10.8	23 10 36.24	. .	102 4 9.7	. .
	33	Mars II	5	10 54.72	− 0.84	− 15.74	50 54 . .	. .	. .	23 10 38.14	. .	. . . .	. .
	34	Saturn I, N.	6	17 17.60	− 0.76	− 15.74	45 51 59.08	+ 4 55.51	+ 59.4	23 17 1.10	. .	97 4 15.2	. .
	35	Saturn II, S.	5	17 18.90	− 0.76	− 15.74	45 51 59.08	+ 5 13.54	+ 59.4	23 17 2.40	. .	97 4 33.2	.
	36	Weisse 394	9	21 22.97	− 0.87	− 15.74	52 27 59.89	+ 21.33	+ 1 14.8	23 21 6.36	− 4.08	103 35 57.2	+23.7
	37	B. A. C. 8199	9	26 10.64	− 0.84	− 15.75	51 3 59.82	+ 1 26.28	+ 1 11.2	23 25 54.05	− 4.04	102 12 58.5	+24.0
	38	B. A. C. 8221	9	31 37.63	− 0.87	− 15.75	52 36 1.94	+ 27.41	+ 1 15.2	23 31 21.01	− 4.06	103 44 5.7	+24.4
	39	B. A. C. 8266	9	41 16.57	− 0.85	− 15 75	51 25 59.84	+ 1 30.18	+ 1 12.2	23 40 59.97	− 4.01	102 35 3.4	+24.9
	40	α Andromedæ	9	2 21.41	− 0.11	− **15.69**	10 24 1.38	+ 4 26.84	+ 10.6	0 2 5.55	− 0.03	61 35 0.0	+ 2.2
	41	γ Pegasi	9	7 14.06	− 0.39	− **15.77**	24 17 58.20	+ 4 53.48	+ 26.1	0 6 57.92	+ 0.03	75 29 39.0	+ 1.7
4	42	*d* Sagittarii	9	10 46.83	− 1.21	− **15.50**	57 58 . .	. .	. .	19 10 30.16	+ 0.07	. . . .	. .
S.	43	δ Aquilæ	9	19 37.32	− 0.78	− **15.38**	35 56 . .	. .	. .	19 19 21.08	− 0.01	. . . .	. .
	44	κ Aquilæ	9	30 36.53	− 0.97	− **15.51**	46 6 . .	. .	. .	19 30 20.09	+ 0.08	. . . .	. .
	45	γ Aquilæ	9	40 44.17	− 0.63	− **15.53**	28 30 . .	. .	. .	19 40 28.08	+ 0.10	. . . .	. .
	46	α Aquilæ	9	45 6.39	− 0.67	− **15.44**	30 16 . .	. .	. .	19 44 50.25	+ 0.01	. . . .	. .
	47	λ Ursæ Minoris	6	46 6.70	+65.54	− 15.48	309 54 . .	. .	. .	19 46 56.76	− 1.43	. . . .	. .
	48	τ Aquilæ	8	58 27.47	− 0.70	− **15.45**	31 52 . .	. .	. .	19 58 11.29	0.00	. . . .	. .
	49	ξ Aquarii	9	31 32.79	− 0.99	− **15.58**	47 12 . .	. .	. .	21 31 16.27	+ 0.11	. . . .	. .
	50	ε Pegasi	9	38 28.52	− 0.65	− **15.49**	29 30 . .	. .	. .	21 38 12.33	− 0.05	. . . .	. .

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	29.82	73.0	70.2
7	29.82	73.0	70.0
12	29.83	72.6	69.2
16	30.05	63.5	61.2
26	30.06	61.4	59.8
27	30.07	60.2	58.2
32	30.06	59.2	57.6
39	30.07	59.0	57.0
41	30.05	58.6	56.5

For summary of the elements of reduction see page 3.

37. One bisection.
18. Four bisections.

ZENITH-POINT CORR.

No. 1 to 14 + 60.″74
No. 16 to 41 + 60.54

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	− 18.1	. .	− 0.0	− 18.1
32	− 18.1	. .	− 0.0	− 18.1
34	− 0.7	+ 9.0	. .	+ 8.3
35	− 0.7	− 9.0	. .	− 9.7

ATE AND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
pt. 4	1	μ Capricorni	9	46 56.22	− 1.10	− **15.61**	52 56 . .	. .	. .	21 46 39.58	+ 0.07	. . . .	. .
S.	2	α Aquarii	9	59 48.26	− 0.85	− **15.56**	39 44 . .	. .	. .	21 59 31.80	+ 0.03	. . . .	. .
	3	θ Aquarii	9	10 41.12	− 0.99	− **15.53**	47 12 . .	. .	. .	22 10 24.57	− 0.01	. . . .	. .
	4	π Aquarii	9	19 19.92	− 0.82	− **15.51**	38 4 . .	. .	. .	22 19 3.54	− 0.02	. . . .	. .
9	5	α Ursæ Majoris	. .	. .	. .	. .	336 24 11.42	+ 5 8.42	− 24.3	. . . .	. .	27 35 16.7	− 3.0
10	6	B. A. C. 4340	. .	. .	. .	. .	34 43 51.68	+ 4 3.60	+ 38.6	. . . .	. .	85 54 55.1	− 10.3
	7	12 Canum Venat.	. .	. .	. .	. .	359 49 56.18	+ 4 50.61	− 0.1	. . . .	. .	51 1 7.9	− 0.3
	8	Polaris, S. P.	. .	. .	. .	. .	307 29 57.55	+ 4 11.70	− 1 12.0	. . . .	. .	358 39 18.4	− 3.0
	9	Venus, N.	. .	. .	. .	. .	47 1 55.68	+ 4 35.39	+ 59.6	. . . .	. .	98 13 51.9	. .
	10	ζ Virginis	. .	. .	. .	. .	38 45 53.95	+ 5 12.81	+ 44.6	. . . .	. .	89 58 12.6	+ 3.6
	11	η Ursæ Majoris	. .	. .	. .	. .	348 53 55.88	+ 4 17.60	− 10.8	. . . .	. .	40 4 23.9	− 1.6
12	12	κ Aquilæ	9	30 38.66	− 0.80	− **17.91**	46 6 . .	. .	. .	19 30 20.03	+ 0.12	. . . .	. .
	13	γ Aquilæ	9	40 46.16	− 0.50	− **17.75**	28 30 . .	. .	. .	19 40 27.83	− 0.05	. . . .	. .
	14	λ Ursæ Minoris	5	46 7.28	+ 59.95	− 17.83	309 54 . .	. .	. .	19 46 49.40	− 0.35	. . . .	. .
15	15	Aquarii	. .	. .	. .	. .	39 43 57.18	+ 3 35.40	+ 46.7	. . . .	. .	90 54 40.5	0.0
	16	π Aquarii	. .	. .	. .	. .	38 3 47.12	+ 3 33.91	+ 44.0	. . . .	. .	89 14 26.2	+ 1.0
	17	η Aquarii	. .	. .	. .	. .	39 33 52.82	+ 3 42.28	+ 46.4	. . . .	. .	90 44 42.7	+ 0.9
	18	64 Aquarii	. .	. .	. .	. .	49 29 53.48	+ 2 21.77	+ 1 5.6	. . . .	. .	100 39 42.1	+ 20.3
	19	70 Aquarii	. .	. .	. .	. .	50 3 51.38	+ 36.56	+ 1 6.9	. . . .	. .	101 11 56.0	+ 20.9
	20	74 Aquarii	. .	. .	. .	. .	51 7 48.79	+ 32.09	+ 1 9.8	. . . .	. .	102 15 51.9	+ 21.2
	21	B. A. C. 8004	. .	. .	. .	. .	52 33 47.45	+ 2 4.01	+ 1 13.2	. . . .	. .	103 43 25.8	+ 21.5
	22	Mars C.	. .	. .	. .	. .	51 33 48.70	+ 1 57.05	+ 1 10.6	. . . .	. .	102 43 17.5	. .
	23	Saturn, N.	. .	. .	. .	. .	46 13 49.65	+ 5 9.00	+ 58.6	. . . .	. .	97 26 18.5	. .
	24	Saturn, S.	. .	. .	. .	. .	46 13 49.65	+ 5 24.83	+ 58.6	. . . .	. .	97 26 34.3	. .
18	25	γ Aquilæ	9	40 46.77	− 0.56	− **18.38**	28 29 58.98	+ 4 4.73	+ 31.1	19 40 27.87	+ 0.07	79 40 56.0	+ 0.8
	26	λ Ursæ Minoris	3	45 56.20	+ 63.90	− 18.34	309 54 . .	. .	. .	19 46 41.79	− 0.41	. . . .	. .
	27	τ Aquilæ	9	58 30.07	− 0.02	− **18.30**	31 51 55.55	+ 5 0.59	+ 35.6	19 58 11.10	− 0.02	83 3 52.9	+ 0.9
	28	α² Capricorni	9	11 36.93	− 1.00	− **18.38**	51 43 47.90	+ 3 59.60	+ 1 17.6	20 11 17.57	+ 0.08	102 55 21.3	+ 0.4
	29	α Cygni	9	37 35.07	+ 0.38	− **18.42**	353 57 55.65	+ 5 0.98	− 6.0	20 37 17.08	+ 0.09	45 9 11.8	+ 1.4
	30	μ Aquarii	9	46 24.26	− 0.93	− **18.37**	48 13 44.30	+ 5 15.43	+ 1 4.3	20 46 4.95	+ 0.06	99 26 25.2	+ 0.9
	31	ν Cygni	9	52 56.31	+ 0.22	− **18.39**	358 7 48.75	+ 3 53.12	− 1.8	20 52 38.15	+ 0.05	49 18 1.3	+ 3.0
	32	61¹ Cygni	8	1 44.52	+ 0.12	− **18.33**	0 39 54.48	+ 4 36.07	+ 0.7	21 1 26.25	− 0.07	51 50 52.5	− 0.4
	33	Moon I, S.	9	21 19.89	− 1.11	− 18.40	56 31 53.95	+ 5 1.84	+ 1 26.9	21 21 0.38	+ 63.65	107 44 43.9	. .
	34	μ Capricorni	9	46 52.88	− 1.04	− **18.37**	52 55 52.78	+ 4 0.57	+ 1 16.1	21 46 39.43	− 0.04	104 7 30.7	+ 1.0
	35	α Aquarii	9	59 51.06	− 0.78	− **18.46**	39 43 52.35	+ 3 40.67	+ 47.8	21 59 31.80	+ 0.06	90 54 42.0	+ 1.7
21	36	γ Aquilæ	9	40 47.28	− 0.83	− **18.66**	28 30 . .	. .	. .	19 40 27.86	+ 0.10	. . . .	. .
	37	α Aquilæ	9	45 9.49	− 0.87	− **18.55**	30 16 . .	. .	. .	19 44 50.03	0.00	. . . .	. .
	38	λ Ursæ Minoris	5	45 47.56	+ 69.44	− 18.59	309 54 . .	. .	. .	19 46 38.41	− 0.19	. . . .	. .
	39	O. Arg. S. 20315	9	8 51.99	− 1.37	− 18.59	53 57 56.35	+ 3 32.62	+ 1 18.9	20 8 32.03	− 3.80	105 9 9.1	+ 6.1
	40	O. Arg. S. 20392	9	12 32.65	− 1.36	− 18.59	53 27 52.62	+ 4 46.56	+ 1 17.6	20 12 12.73	− 3.80	104 40 18.0	+ 6.6
	41	Lalande 39140	9	16 57.29	− 1.36	− 18.59	53 27 52.62	+ 3 19.31	+ 1 17.5	20 16 37.34	− 3.82	104 38 50.6	+ 7.0
	42	Lalande 39247	9	19 33.95	− 1.38	− 18.59	54 9 54.52	+ 5 3.92	+ 1 19.6	20 19 14.01	− 3.85	105 22 39.2	+ 7.1
	43	Lalande 39486	9	25 25.79	− 1.35	− 18.59	52 59 56.75	+ 3 35.79	+ 1 16.1	20 25 5.85	− 3.84	104 11 12.8	+ 8.0
	44	Lalande 39671¹	6	29 48.38	− 1.39	− 18.59	54 31 55.95	+ 4 17.00	+ 1 20.7	20 29 28.40	− 3.91	105 43 54.9	+ 7.9
	45	Lalande 39671²	5	29 48.50	+ 1.38	− 18.59	54 31 55.95	+ 4 12.89	+ 1 20.7	20 29 28.53	− 3.91	105 43 50.7	+ 7.9
	46	μ Aquarii	9	46 24.87	− 1.24	− **18.70**	48 13 52.88	+ 5 7.65	+ 1 4.5	20 46 5.04	+ 0.18	99 26 26.2	+ 1.8
	47	ν Cygni	9	52 56.63	+ 0.04	− **18.58**	358 7 47.85	+ 3 53.66	− 1.8	20 52 38.07	+ 0.02	49 18 0.9	+ 3.2
	48	61¹ Cygni	9	1 44.86	− 0.05	− **18.54**	0 40 0.32	+ 4 32.35	+ 0.7	21 1 26.21	− 0.07	51 50 54.6	+ 2.4
	49	61² Cygni	. .	. .	. .	. .	0 40 0.32	+ 4 40.65	+ 0.7	. . . .	. .	51 51 2.3	+ 21.2
	50	ζ Cygni	9	8 4.06	− 0.34	− **18.51**	9 5 51.12	+ 3 55.05	+ 9.3	21 7 4.12	− 0.06	60 16 16.7	+ 1.4

o.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
5	30.11	70.5	73.0
8	30.10	76.0	76.3
8	30.17	71.5	70.2
5	30.05	71.8	70.0
1	30.05	72.0	70.2
5	30.06	62.0	61.0
9	30.08	60.6	59.2
1	30.07	59.4	58.2
9	30.11	61.2	59.0
5	30.12	61.8	59.0

For summary of the elements of reduction see page 3

10, 17. One bisection.
33. Three bisections.
22. Four bisections.
8. Five bisections.

ZENITH-POINT CORR.	″
No. 5 to 11	+ 54.44
No. 15 to 24	+ 1 1.24
No. 25 to 35	+ 1 0.44
No. 39 to 50	+ 58.98

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
9	− 4.9	+ 6.5	. .	+ 1.6
22	− 17.7	. .	. .	− 17.8
23	− 0.7	+ 7.9	. .	+ 7.2
24	− 0.7	− 7.9	. .	− 8.6
33	− 44 59.3	− 14 45.48	. .	− 59 44.8

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Sept. 21	1	1 Pegasi . . .	9	16 46.34	− 0.62	− 18.60	19 31 54.82	+ 4 20.29	+ 20.5	21 16 27.12	− 0.17	70 42 56.8	+ 2.
F.	2	ξ Aquarii . . .	9	31 35.99	− 1.22	− **18.62**	47 11 54.85	+ 4 44.48	+ 1 2.3	21 31 16.17	+ 0.08	98 24 2.8	+ 1.
	3	θ Aquarii . . .	9	10 44.39	− 1.21	− **18.60**	47 11 51.95	+ 4 7.95	+ 1 2.4	22 10 24.57	+ 0.01	98 23 23.5	+ 0.
	4	50 Aquarii . . .	9	18 15.88	− 1.33	− 18.61	52 59 57.49	+ 1 13.22	+ 1 16.5	22 17 55.94	− 4.17	104 8 48.4	+18.
	5	σ Aquarii . . .	2	24 32.48	− 1.27	− 18.61	50 10 0.90	+ 33.14	+ 1 9.2	22 24 12.60	− 4.11	. . . .	.
	6	64 Aquarii . . .	9	33 11.71	− 1.25	− 18.61	49 29 57.28	+ 2 16.66	+ 1 7.6	22 32 51.85	− 4.11	101 18 4.4	+19.
	7	70 Aquarii . . .	9	42 25.91	− 1.26	− 18.61	50 3 57.91	+ 27.53	+ 1 9.0	22 42 6.04	− 4.13	100 39 42.8	+20.
	8	λ Aquarii . . .	9	46 35.80	− 1.19	− **18.69**	47 1 55.75	+ 4 20.40	+ 1 2.2	22 46 16.00	+ 0.18	101 11 55.6	+20.
	9	Mars I, C. . .	6	53 13.52	− 1.29	− 18.61	51 37 54.59	+ 1 57.10	+ 1 13.1	22 52 53.62	+ 0.92	98 13 39.5	+ 1.
	10	Mars II . . .	5	53 15.35	− 1.29	− 18.61	. . . .	. .	. .	22 52 55.45	− 0.91	102 47 26.0	.
	11	α Pegasi . . .	9	59 1.17	− 0.69	− **18.61**	24 15 51.62	+ 4 19.46	+ 26.2	22 58 41.87	+ 0.02	75 26 58.5	+ 1.
	12	Weisse 1241 .	9	0 15.43	− 1.24	− 18.61	49 5 56.69	+ 2 15.87	+ 1 6.9	22 59 55.58	− 4.12	100 15 40.6	+22.
	13	Weisse 76 . .	9	6 57.99	− 1.24	− 18.61	49 5 56.69	+ 31.37	+ 1 6.8	23 6 38.14	− 4.13	100 13 56.1	+22.
	14	ψ² Aquarii . . .	9	11 54.64	− 1.22	− 18.61	48 41 55.88	+ 1 27.00	+ 1 6.0	23 11 34.81	− 4.12	99 50 50.1	+23.
	15	97 Aquarii . . .	9	16 36.56	− 1.36	− 18.61	54 33 58.39	+ 46.21	+ 1 21.4	23 16 16.59	− 4.24	105 42 27.2	+22.
	16	θ Piscium . . .	9	22 7.11	− 0.88	− **18.58**	33 5 58.18	+ 4 24.42	+ 37.9	23 21 47.62	+ 0.02	84 17 21.7	+ 0.
	17	ι Piscium . . .	9	34 0.89	− 0.90	− **18.57**	33 50 2.65	+ 4 55.84	+ 39.0	23 33 41.37	− 0.08	85 1 58.7	− 0.
	18	α Andromedæ .	9	2 24 72	− 0.31	− **18.61**	10 23 54.28	+ 4 26.79	+ 10.8	0 2 5.79	+ 0.02	61 34 53.1	− 0.
	19	γ Pegasi . . .	9	7 17.40	− 0.67	− **18.63**	24 17 51.18	+ 4 55.60	+ 26 4	0 6 58.11	+ 0.02	75 29 34.4	− 0.
22	20	γ Aquilæ . . .	9	40 47.29	− 0.73	− **18.79**	28 29 57.10	+ 4 6.48	+ 31.5	19 40 27 75	+ 0.01	79 40 56.3	+ 1.
	21	α Aquilæ . . .	9	45 9 58	− 0.77	− **18.76**	30 16 . .	. .	. .	19 44 50.00	− 0.01	. . . . .	. .
	22	λ Ursæ Minoris .	5	45 43.16	+72.60	− 18.81	309 54 . .	. .	. .	19 46 36.95	− 0.52	. . .	. .
	23	τ Aquilæ . . .	9	58 30.72	− 0.81	− **18.81**	31 52 0.10	+ 4 55.93	+ 36.1	19 58 11.10	+ 0.03	83 3 53.3	+ 1.4
	24	O. Arg. S. 20345	9	8 52.13	− 1.30	− 18.81	53 58 0.70	+ 3 28.50	+ 1 19.7	20 8 32.02	− 3.79	105 9 10.1	+ 6.0
	25	α² Capricorni . .	9	11 37.62	− 1.25	− **18.86**	51 43 50.90	+ 3 57.18	+ 1 13.5	20 11 17.56	+ 0.11	102 55 22.8	+ 1.8
	26	O. Arg. S. 20392	1	12 32.74	− 1.29	− 18.81	53 27 51.02	+ 4 47.48	+ 1 18.3	20 12 12.64	− 3.79	104 40 18.0	+ 6.5
	27	Lalande 39140 .	9	16 57.41	− 1.29	− 18.81	53 27 53.25	+ 3 17.39	+ 1 18.3	20 16 37.31	− 3.81	104 38 50.1	+ 7.0
	28	π Capricorni . .	9	20 40.94	− 1.39	− **18.83**	57 23 51.35	+ 5 0.33	+ 1 30.8	20 20 20.74	+ 0.06	108 36 43.7	+ 2.4
	29	ε Delphini . .	9	27 43.01	− 0.73	− 18.81	27 56 . .	. .	. .	20 27 23.47	+ 0.07	. . . . .	. .
	30	Lalande 39671¹.	5	29 48.56	− 1.33	− 18.81	54 31 57 65	+ 4 12.20	+ 1 21.5	20 29 28.42	− 3.90	105 43 52.5	+ 7.9
	31	Lalande 39671².	3	29 48 89	− 1.33	− 18.81	54 31 57.65	+ 4 8.72	+ 1 21.5	20 29 28 75	− 3.90	105 43 49.1	+ 7.9
	32	α Cygni . . .	9	37 35.29	+ 0.32	− 18.80	353 57 58.85	+ 4 50.52	− 6.1	20 37 16.81	− 0.09	45 9 10.5	+ 0.9
	33	ν Cygni . . .	9	52 56.62	+ 0.12	− 18.80	358 7 50.25	+ 3 51.66	− 1.8	20 52 37.94	+ 0.09	49 18 1.3	+ 3.8
	34	61¹ Cygni . . .	9	1 44.82	+ 0.03	− 18.80	0 39 56.55	+ 4 35.30	+ 0.8	21 1 26.05	− 0.21	51 50 53.8	+ 1.7
	35	ζ Cygni . . .	9	8 4.18	− 0.26	− 18.80	9 5 54 20	+ 3 52.60	+ 9.4	21 7 45.12	− 0.05	60 16 17.4	+ 2.3
	36	θ Aquarii . . .	9	10 44.61	− 1.18	− 18.79	47 11 54.95	+ 4 4.82	+ 1 3.0	22 10 24.64	+ 0.09	98 23 24.0	+ 1.2
	37	50 Aquarii . . .	9	18 16.01	− 1.31	− 18.79	53 0 0.70	+ 1 9.81	+ 1 17.5	22 17 55.91	− 4.16	104 8 49.2	+18.4
	38	σ Aquarii . . .	9	24 32.48	− 1.25	− 18.79	50 10 0 02	+ 33.41	+ 1 10.0	22 24 12.44	− 4.11	101 18 4.6	+19.4
	39	η Aquarii . . .	9	29 25.87	+ 1.03	− **18.78**	39 33 55.05	+ 3 37.95	+ 48.4	22 29 6.05	+ 0.03	90 44 42.6	+ 1.2
	40	64 Aquarii . . .	9	33 11.88	− 1.24	− 18.79	49 30 0.89	+ 2 10.54	+ 1 8.5	22 32 51.85	− 4.11	100 39 41.1	+20.2
	41	70 Aquarii . . .	9	42 26.09	− 1.26	− 18.79	50 3 57.09	+ 29.56	+ 1 9.8	22 42 6.04	− 4.13	101 11 57.8	+20.8
	42	λ Aquarii . . .	9	46 35.87	− 1.19	− **18.77**	47 1 54.98	+ 4 20.81	+ 1 2 9	22 46 15.89	+ 0.08	98 13 39.9	− 1.4
	43	α Piscis Aust. .	9	51 16.33	− 1.72	− **18.90**	69 4 . .	. .	. .	22 50 55.82	+ 0.12	. . . . .	. .
	44	Mars I, C. . .	6	52 30.12	− 1.29	− 18.79	51 38 . .	. .	. .	22 52 10.64	+ 0.86	. . . . .	. .
	45	Mars II . . .	3	52 31.82	− 1.29	− 18.79	51 38 . .	. .	. .	22 52 11.74	− 0.84	. . . . .	. .
	46	α Pegasi . . .	9	59 1 32	− 0.69	− **18.77**	24 15 53.50	+ 4 17.88	+ 26.5	22 58 41.84	0.00	75 26 59.1	+ 2.2
	47	Weisse 1241 .	3	0 15.58	− 1.23	− 18.79	49 5 51.31	+ 2 24.00	+ 1 7.6	22 59 55.56	− 4.13	100 15 44.1	+22.2
	48	Weisse 76 . .	9	6 58.17	− 1.23	− 18.79	49 5 51.31	+ 35.67	+ 1 7.5	23 6 38.15	− 4.13	100 14 55.6	+22.7
	49	ψ² Aquarii . . .	9	11 54.87	− 1.22	− 18.79	48 41 57.26	+ 26.30	+ 1 6.6	23 11 34.86	− 4.12	99 50 51 4	+23.1
	50	97 Aquarii . . .	9	16 36.71	− 1.36	− 18.78	54 33 56.20	+ 48.39	+ 1 22.2	23 16 16.57	− 4.24	105 42 28.0	+22.8

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	30.14	60.8	58.1
7	30.18	59.8	56.8
15	30.18	58.4	55.0
19	30.19	56.5	54.0
20	30.28	61.0	58.2
32	30.28	59.0	56.0
34	30.29	58.5	55.2
37	30.30	56.5	53.5
41	30.31	56.2	53.0
48	30.31	55.5	53.0

For summary of the elements of reduction see page 3.

5, 30, 31, 48, 49. One bisection.

ZENITH-POINT CORR.

No. 1 to 19 + 58.98″
No. 20 to 50 + 58.37

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
9	− 17.1	. .	− 0.1	− 17.2

TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77,				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
t. 22 F.	1	θ Piscium . . .	9	22 7.34	− 0.90	**− 18.79**	33 5 54.32	+ 4 30.07	+ 38.3	23 21 47.66	+ 0.06	84 17 23.9	+ 2.7
	2	ι Piscium . . .	9	34 1.04	− 0.91	**− 18.71**	33 50 0.60	+ 5 0.11	+ 39.4	23 33 41.35	− 0.10	85 2 1.3	+ 2.0
24	3	μ Aquarii . . .	9	46 25.17	− 1.12	**− 19.15**	48 14 2.38	+ 4 56.02	+ 1 4.2	20 46 5.00	+ 0.17	99 26 23.8	− 0.1
	4	ν Cygni . . .	9	52 56.87	+ 0.16	**− 18.99**	358 7 57.40	+ 3 41.92	− 1.8	20 52 37.98	− 0.02	49 17 58.7	+ 1.6
	5	ζ Cygni . . .	9	8 4.39	− 0.22	**− 18.99**	9 5 56.28	+ 3 48.75	+ 9.2	21 7 45.12	− 0.03	60 16 15.4	+ 0.6
	6	ι Pegasi . . .	9	16 46.69	− 0.50	**− 18.99**	19 32 3.85	+ 4 8.55	+ 20.4	21 16 27.14	− 0.12	70 42 54.0	+ 0.5
	7	ι Draconis, S. P. .	6	19 57.55	−10.30	− 19.05	300 44 . .	. .	. .	9 19 28.20	− 0.64	. . . . .	. .
	8	β Aquarii . . .	9	25 29.01	− 1.06	**− 19.12**	41 56 9.22	+ 2 57.15	+ 57.3	21 25 8.90	+ 0.08	96 6 24.9	+ 1.0
	9	β Cephei . . .	5	27 22.77	+ 2.63	− 19.05	328 47 58.75	+ 4 36.56	− 34.6	21 27 6.35	+ 0.10	19 58 21.9	− 1.0
	10	ξ Aquarii . . .	9	31 36.32	− 1.11	− 19.05	47 12 15.78	+ 4 22.62	+ 1 2.1	21 31 16.16	+ 0.09	98 24 1.7	+ 0.6
	11	ε Pegasi . . .	9	38 32.01	− 0.74	− 19.05	29 30 0.98	+ 4 3.10	+ 32.6	21 38 12.22	− 0.06	80 40 57.9	+ 1.3
	12	μ Capricorni . .	9	46 59.79	− 1.23	− 19.05	52 56 3.28	+ 3 51.35	+ 1 16.1	21 46 39.51	+ 0.08	104 7 31.9	+ 2.0
	13	α Aquarii . . .	9	59 51.80	− 0.95	**− 19.06**	39 43 55.82	+ 3 35.70	+ 47.9	21 59 31.79	+ 0.02	90 54 40.6	+ 0.5
	14	θ Aquarii . . .	9	10 44.79	− 1.11	**− 19.11**	47 11 59.28	+ 3 59.84	+ 1 2.2	22 10 24.62	+ 0.07	98 23 22.5	− 0.3
	15	50 Aquarii . . .	9	18 16.16	− 1.23	− 19.06	53 0 0.48	+ 1 10.60	+ 1 16.3	22 17 55.87	− 4.16	104 8 48.6	+18.3
	16	σ Aquarii . . .	9	24 32.58	− 1.17	− 19.06	50 10 3.69	+ 29.58	+ 1 9.0	22 24 12.35	− 4.10	101 18 3.4	+19.1
	17	η Aquarii . . .	2	29 26.00	− 0.95	**− 19.00**	39 33 58.28	+ 3 34.93	+ 47.7	22 29 5.99	− 0.02	90 44 42.1	+ 0.7
	18	64 Aquarii . . .	9	33 12.02	− 1.17	− 19.06	49 30 0.90	+ 2 11.12	+ 1 7.5	22 32 51.79	− 4.10	100 39 40.8	+20.1
	19	70 Aquarii . . .	5	42 26.18	− 1.18	− 19.06	50 3 59.66	+ 25.33	+ 1 8.8	22 42 5.94	− 4.13	101 11 55.0	+20.8
	20	Mars I, C. . .	6	51 10.58	− 1.18	− 19.06	51 35 54.40	+ 1 41.57	+ 1 12.7	22 50 50.34	+ 0.87	102 45 9.9	. .
	21	Mars II . . .	5	51 12.30	− 1.18	− 19.06	51 38 . .	. .	. .	22 50 52.06	− 0.85	. . . . .	. .
	22	α Pegasi . . .	9	59 1.57	− 0.62	**− 19.09**	24 16 . .	. .	. .	22 58 41.89	+ 0.05	. . . . .	. .
	23	Weisse 1241 .	9	0 15.79	− 1.16	− 19.06	49 5 58.24	+ 2 16.69	+ 1 6.6	22 59 55.57	− 4.13	100 15 42.7	+22.2
	24	Weisse 76 . .	9	6 58.43	− 1.16	− 19.06	49 5 58.24	+ 29.70	+ 1 6.5	23 6 38.21	− 4.13	100 13 55.7	+22.6
	25	ψ² Aquarii . . .	9	11 54.98	− 1.15	− 19.06	48 41 55.98	+ 1 27.84	+ 1 5.6	23 11 34.73	− 4.13	99 50 50.7	+23.0
	26	97 Aquarii . . .	9	16 36.86	− 1.28	− 19.06	54 33 56.28	+ 50.25	+ 1 21.0	23 16 16.52	− 4.24	105 42 28.8	+22.7
	27	θ Piscium . . .	9	22 7.52	− 0.82	**− 19.04**	33 6 . .	. .	. .	23 21 47.63	+ 0.02	. . . . .	. .
25	28	λ Ursæ Minoris .	4	45 42.52	+70.31	− 18.99	309 54 . .	. .	. .	19 46 33.84	− 0.20	. . . . .	. .
	29	τ Aquilæ . . .	9	58 30.81	− 0.82	**− 18.94**	31 52 . .	. .	. .	19 58 11.00	− 0.02	. . . . .	. .
	30	α² Capricorni . .	8	11 37.71	− 1.23	**− 19.02**	51 44 . .	. .	. .	20 11 17.48	+ 0.08	. . . . .	. .
	31	ε Delphini. . .	8	27 43.18	− 0.71	**− 19.05**	27 56 . .	. .	. .	20 27 23.47	+ 0.11	. . . . .	. .
	32	α Cygni . . .	9	37 35.59	+ 0.31	**− 19.02**	353 58 . .	. .	. .	20 37 16.89	+ 0.05	. . . . .	. .
	33	61¹Cygni . . .	9	1 45.11	+ 0.08	**− 18.98**	0 40 . .	. .	. .	21 1 26.08	− 0.14	. . . . .	. .
	34	ζ Cygni . . .	9	8 4.38	− 0.20	**− 19.02**	9 6 . .	. .	. .	21 7 45.17	+ 0.04	. . . . .	. .
	35	ι Pegasi . . .	9	16 46.70	− 0.49	**− 19.02**	19 32 . .	. . .	. .	21 16 27.19	− 0.06	. . . . .	. .
	36	β Aquarii . . .	9	25 28.96	− 1.04	**− 19.10**	44 54 . .	. .	. .	21 25 8.90	+ 0.09	. . . . .	. .
	37	β Cephei . . .	9	27 22.84	+ 2.77	− 19.02	328 48 . .	. .	. .	21 27 6.59	+ 0.40	. . . . .	. .
	38	ξ Aquarii . . .	9	31 36.22	− 1.10	**− 19.00**	47 12 . . .	. .	. .	21 31 16.10	+ 0.04	. . . . .	. .
	39	ε Pegasi . . .	9	38 31.96	− 0.71	**− 18.97**	29 30 . .	. .	. .	21 38 12.22	− 0.06	. . . . .	. .
. 26	40	λ Ursæ Minoris .	4	45 45.50	+66.49	− 19.08	309 53 49.25	+ 4 30.00	− 1 7.1	19 46 32.91	+ 0.12	1 3 33.3	+ 0.6
	41	τ Aquilæ . . .	9	58 30.89	− 0.76	**− 19.09**	31 51 54.78	+ 5 1.00	+ 35.1	19 58 11.05	+ 0.04	83 3 52.1	+ 0.4
	42	B. A. C. 6930 .	9	3 30.66	+ 1.48	− 19.08	335 17 45.75	+ 3 48.06	− 25.8	20 3 13.06	− 1.36	26 27 29.2	+20.6
	43	O. Arg. S. 20345	9	8 52.16	− 1.19	− 19.08	53 57 51.42	+ 3 39.11	+ 1 17.5	20 8 31.89	− 3.73	105 9 9.2	+ 5.9
	44	α¹ Capricorni . .	9	11 37.72	− 1.15	**− 19.12**	51 43 54.05	+ 3 54.69	+ 1 11.5	20 11 17.47	+ 0.08	102 55 21.4	+ 0.3
	45	Lalande 39210 .	9	18 48.73	− 1.20	− 19.08	54 1 53.05	+ 3 20.16	+ 1 17.8	20 18 28.45	− 3.78	105 12 52.2	+ 6.9
	46	π Capricorni . .	8	20 41.07	− 1.26	**− 19.14**	57 23 53.52	+ 1 59.28	+ 1 28.2	20 20 20.73	+ 0.10	108 36 42.2	+ 0.7
	47	ε Delphini . .	9	27 43.19	− 0.69	**− 19.09**	27 55 51.70	+ 3 50.99	+ 30.0	20 27 23.42	+ 0.07	79 6 33.9	+ 0.5
	48	Lalande 39671¹.	6	29 48.62	− 1.21	− 19.08	54 31 52.48	+ 4 21.59	+ 1 19.3	20 29 28.33	− 3.84	105 43 54.6	+ 7.8
	49	Lalande 39671².	5	29 48.72	− 1.21	− 19.08	54 31 52.48	+ 4 18.11	+ 1 19.3	20 29 28.43	− 3.84	105 43 51.1	+ 7.8
	50	α Cygni . . .	9	37 35.61	+ 0.25	**− 19.00**	353 57 51.88	+ 5 2.68	− 5.9	20 37 16.78	− 0.04	45 9 9.9	+ 1.0

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.31	55.8	52.5
30.23	65.5	62.5
30.22	63.0	61.0
30.22	62.0	59.8
30.26	61.5	59.2
30.25	60.8	59.0
30.15	71.0	69.7

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
20	− 16.8	. .	− 0.1	− 16.9

ZENITH-POINT CORR.

No. 1 to 2 + 58.″37
No. 3 to 26 + 57.78
No. 40 to 50 + 58.62

19. One bisection.
20, 50. Four bisections.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Sept. 21	1	ι Pegasi . . .	9	16 46.34	− 0.62	− 18.60	19 31 54.82	+ 4 20.29	+ 20.5	21 16 27.12	− 0.17	70 42 56.8	+ 2.9
F.	2	ξ Aquarii . . .	9	31 35.99	− 1.22	− **18.62**	47 11 54.85	+ 4 44.48	+ 1 2.3	21 31 16.17	+ 0.08	98 24 2.8	+ 1.7
	3	θ Aquarii . . .	9	10 44.39	− 1.21	− **18.60**	47 11 51.95	+ 4 7.95	+ 1 2.4	22 10 24.57	+ 0.01	98 23 23.5	+ 0.7
	4	50 Aquarii . . .	9	18 15.88	− 1.33	− 18.61	52 59 57.49	+ 1 13.22	+ 1 16.5	22 17 55.94	− 4.17	104 8 48.4	+18.4
	5	σ Aquarii . . .	2	24 32.48	− 1.27	− 18.61	50 10 0.90	+ 33.14	+ 1 9.2	22 24 12.60	− 4.11	. . . . .	. .
	6	64 Aquarii . . .	9	33 11.71	− 1.25	− 18.61	49 29 57.28	+ 2 16.66	+ 1 7.6	22 32 51.85	− 4.11	101 18 4.4	+19.4
	7	70 Aquarii . . .	9	42 25.91	− 1.26	− 18.61	50 3 57.91	+ 27.53	+ 1 9.0	22 42 6.04	− 4.13	100 39 42.8	+20.2
	8	λ Aquarii . . .	9	46 35.80	− 1.19	− **18.69**	47 1 55.75	+ 4 20.40	+ 1 2.2	22 46 16.00	+ 0.18	101 11 55.6	+20.8
	9	Mars I, C. . .	6	53 13.52	− 1.29	− 18.61	51 37 54.59	+ 1 57.10	+ 1 13.1	22 52 53.62	+ 0.92	98 13 39.5	+ 1.0
	10	Mars II . . .	5	53 15.35	− 1.29	− 18.61	. . . .	. .	. .	22 52 55.45	− 0.91	102 47 26.0	. .
	11	α Pegasi . . .	9	59 1.17	− 0.69	− **18.61**	24 15 51.62	+ 4 19.46	+ 26.2	22 58 41.87	+ 0.02	75 26 58.5	+ 1.5
	12	Weisse 1241 .	9	0 15.43	− 1.24	− 18.61	49 5 56.69	+ 2 15.87	+ 1 6.9	22 59 55.58	− 4.12	100 15 40.6	+22.2
	13	Weisse 76 . .	9	6 57.99	− 1.24	− 18.61	49 5 56.69	+ 31.37	+ 1 6.8	23 6 38.14	− 4.13	100 13 56.1	+22.7
	14	ψ² Aquarii . . .	9	11 54.64	− 1.22	− 18.61	48 41 55.88	+ 1 27.00	+ 1 6.0	23 11 34.81	− 4.12	99 50 50.1	+23.1
	15	97 Aquarii . . .	9	16 36.56	− 1.36	− 18.61	54 33 58.39	+ 40.21	+ 1 21.4	23 16 16.59	− 4.24	105 42 27.2	+22.9
	16	θ Piscium . . .	9	22 7.11	− 0.88	− **18.58**	33 5 58.18	+ 4 24.42	+ 37.9	23 21 47.62	+ 0.02	84 17 21.7	+ 0.4
	17	ι Piscium . . .	9	34 0.89	− 0.90	− **18.57**	33 50 2.65	+ 4 55.84	+ 39.0	23 33 41.37	− 0.08	85 1 58.7	− 0.7
	18	α Andromedæ .	9	2 24 72	− 0.31	− **18.61**	10 23 54.28	+ 4 26.79	+ 10.8	0 2 5.79	+ 0.02	61 34 53.1	− 0.6
	19	γ Pegasi . . .	9	7 17.40	− 0.67	− **18.63**	24 17 51.18	+ 4 55.60	+ 26 4	0 6 58.11	+ 0.02	75 29 34.4	− 0.2
22	20	γ Aquilæ . . .	9	40 47.29	− 0.73	− **18.79**	28 29 57.10	+ 4 6.48	+ 31.5	19 40 27 75	+ 0.01	79 40 56.3	+ 1.3
	21	α Aquilæ . . .	9	45 9 58	− 0.77	− **18.76**	30 16 . .	. .	. .	19 44 50.00	− 0.01	. . . . .	. .
	22	λ Ursæ Minoris .	5	45 43.16	+72.60	− 18.81	309 54 . .	. .	. .	19 46 36.95	− 0.52	. . . .	. .
	23	τ Aquilæ . . .	9	58 30.72	− 0.81	− **18.81**	31 52 0.10	+ 4 55.93	+ 36.1	19 58 11.10	+ 0.03	83 3 53.3	+ 1.4
	24	O. Arg. S. 20345	9	8 52.13	− 1.30	− 18.81	53 58 0.70	+ 3 28.50	+ 1 19.7	20 8 32.02	− 3.79	105 9 10.1	+ 6.0
	25	α² Capricorni . .	9	11 37.62	− 1.25	− **18.86**	51 43 50.90	+ 3 57.18	+ 1 13.5	20 11 17.56	+ 0.11	102 55 22.8	+ 1.8
	26	O. Arg. S. 20392	1	12 32.74	− 1.29	− 18.81	53 27 51.02	+ 4 47.48	+ 1 18.3	20 12 12.64	− 3.79	104 40 18.0	+ 6.5
	27	Lalande 39140 .	9	16 57.41	− 1.29	− 18.81	53 27 53.25	+ 3 17.39	+ 1 18.3	20 16 37.31	− 3.81	104 38 50.1	+ 7.0
	28	π Capricorni . .	9	20 40.94	− 1.39	− **18.83**	57 23 51.35	+ 5 0.35	+ 1 30.8	20 20 20.74	+ 0.06	108 36 43.7	+ 2.4
	29	ε Delphini . .	9	27 43.01	− 0.73	− 18.81	27 56 . .	. .	. .	20 27 23.47	+ 0.07	. . . .	. .
	30	Lalande 39671¹.	5	29 48.56	− 1.33	− 18.81	54 31 57 65	+ 4 12.20	+ 1 21.5	20 29 28.42	− 3.90	105 43 52.5	+ 7.9
	31	Lalande 39671².	3	29 48 89	− 1.33	− 18.81	54 31 57.65	+ 4 8.72	+ 1 21.5	20 29 28 75	− 3.90	105 43 49.1	+ 7.9
	32	α Cygni . . .	9	37 35.29	+ 0.32	− 18.80	353 57 58.85	+ 4 50.52	− 6.1	20 37 16.81	− 0.09	45 9 10.5	+ 0.9
	33	ν Cygni . . .	9	52 56.62	+ 0.12	− 18.80	358 7 50.25	+ 3 51.66	− 1.8	20 52 37.94	+ 0.09	49 18 1.3	+ 3.8
	34	61¹Cygni . . .	9	1 44.82	+ 0.03	− 18.80	0 39 56.55	+ 4 35.30	+ 0.8	21 1 26.05	− 0.21	51 50 53.8	+ 1.7
	35	ζ Cygni . . .	9	8 4.18	− 0.26	− 18.80	9 5 54 20	+ 3 52.60	+ 9.4	21 7 45.12	− 0.05	60 16 17.4	+ 2.3
	36	θ Aquarii . . .	9	10 44.61	− 1.18	− 18.79	47 11 54.95	+ 4 4.82	+ 1 3.0	22 10 24.64	+ 0.09	98 23 24.0	+ 1.2
	37	50 Aquarii . . .	9	18 16.01	− 1.31	− 18.79	53 0 0.70	+ 1 9.81	+ 1 17.5	22 17 55.91	− 4 16	104 8 49.2	+18.4
	38	σ Aquarii . . .	9	24 32.48	− 1.25	− 18.79	50 10 0 02	+ 33.41	+ 1 10.0	22 24 12.44	− 4.11	101 18 4.6	+19.4
	39	η Aquarii . . .	9	29 25.87	+ 1.03	− **18.78**	39 33 55.05	+ 3 37.95	+ 48.4	22 29 6.05	+ 0.03	90 44 42.6	+ 1.2
	40	64 Aquarii . . .	9	33 11.88	− 1.24	− 18.79	49 30 0.89	+ 2 10.54	+ 1 8.5	22 32 51.85	− 4.11	100 39 41.1	+20.2
	41	70 Aquarii . . .	9	42 26.09	− 1.26	− 18.79	50 3 57.09	+ 29.56	+ 1 9.8	22 42 6.04	− 4.13	101 11 57.8	+20.8
	42	λ Aquarii . . .	9	46 35.87	− 1.19	− **18.77**	47 1 54.98	+ 4 20.81	+ 1 2 9	22 46 15.89	+ 0.08	98 13 39.9	− 1.4
	43	α Piscis Aust. .	9	51 16.33	− 1.72	− **18.90**	69 4 . .	. .	. .	22 50 55.82	+ 0.12	. . . . .	. .
	44	Mars I, C. . .	6	52 30.12	− 1.29	− 18.79	51 38 . .	. .	. .	22 52 10.64	+ 0.86	. . . . .	. .
	45	Mars II . . .	3	52 31.82	− 1.29	− 18.79	51 38 . .	. .	. .	22 52 11.74	− 0.84	. . . . .	. .
	46	α Pegasi . . .	9	59 1 32	− 0.69	− **18.77**	24 15 53.50	+ 4 17.88	+ 26.5	22 58 41.84	0.00	75 26 59.1	+ 2.2
	47	Weisse 1241 .	3	0 15.58	− 1.23	− 18.79	49 5 51.31	+ 2 24.00	+ 1 7.6	22 59 55.56	− 4.13	100 15 44.1	+22.2
	48	Weisse 76 . .	9	6 58.17	− 1.23	− 18.79	49 5 51.31	+ 35.67	+ 1 7.5	23 6 38.15	− 4.13	100 14 55.6	+22.7
	49	ψ² Aquarii . . .	9	11 54.87	− 1.22	− 18.79	48 41 57.26	+ 26.30	+ 1 6.6	23 11 34.86	− 4.12	99 50 51 4	+23.1
	50	97 Aquarii . . .	9	16 36.71	− 1.36	− 18.78	54 33 56.20	+ 48.39	+ 1 22.2	23 16 16.57	− 4.24	105 42 28.0	+22.8

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	30.14	60.8	58.1
7	30.18	59.8	56.8
15	30.18	58.4	55.0
19	30.19	56.5	54.0
20	30.28	61.0	58.2
32	30.28	59.0	56.0
34	30.29	58.5	55.2
37	30.30	56.5	53.5
41	30.31	56.2	53.0
48	30.31	55.5	53.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
9	− 17.1	. .	− 0.1	− 17.2

ZENITH-POINT CORR.

No. 1 to 19 + 58″.98
No. 20 to 50 + 58.37

5, 30, 31, 48, 49. One bisection.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877,				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Sept. 22	1	θ Piscium . . .	9	22 7.34	− 0.90	**− 18.79**	33 5 54.32	+ 4 30.07	+ 38.3	23 21 47.66	+ 0.06	84 17 23.9	+ 2.7
F.	2	ι Piscium . . .	9	34 1.04	− 0.91	**− 18.71**	33 50 0 60	+ 5 0.11	+ 39.4	23 33 41.35	− 0.10	85 2 1.3	+ 2.0
24	3	μ Aquarii . . .	9	46 25.17	− 1.12	**− 19.15**	48 14 2.38	+ 4 56.02	+ 1 4.2	20 46 5.00	+ 0.17	99 26 23.8	− 0.1
	4	ν Cygni . . .	9	52 56 87	+ 0.16	**− 18.99**	358 7 57.40	+ 3 41.92	− 1.8	20 52 37.98	− 0.02	49 17 58.7	+ 1.6
	5	ζ Cygni . . .	9	8 4.39	− 0.22	**− 18.99**	9 5 56.28	+ 3 48.75	+ 9.2	21 7 45.12	− 0.03	60 16 15.4	+ 0.6
	6	ι Pegasi . . .	9	16 46.69	− 0.50	**− 18.99**	19 32 3.85	+ 4 8.55	+ 20.4	21 16 27.14	− 0.12	70 42 54.0	+ 0.5
	7	ι Draconis, S. P. .	6	19 57.55	−10.30	− 19.05	300 44 . .	. .	. .	9 19 28.20	− 0.64	. . . . .	. .
	8	β Aquarii . . .	9	25 29.01	− 1.06	**− 19.12**	41 56 9.22	+ 2 57.15	+ 57.3	21 25 8.90	+ 0.08	96 6 24.9	+ 1.0
	9	β Cephei . . .	5	27 22.77	+ 2.63	− 19.05	328 47 58.75	+ 4 36.56	− 34.6	21 27 6.35	+ 0.10	19 58 21.9	− 1.0
	10	ξ Aquarii . . .	9	31 36.32	− 1.11	− 19.05	47 12 15.78	+ 4 22.62	+ 1 2.1	21 31 16.16	+ 0.09	98 24 1.7	+ 0.6
	11	ε Pegasi . . .	9	38 32.01	− 0.74	− 19 05	29 30 0.98	+ 4 3.10	+ 32.6	21 38 12.22	− 0.06	80 40 57.9	+ 1.3
	12	μ Capricorni . .	9	46 59.79	− 1.23	− 19.05	52 56 3.28	+ 3 51.35	+ 1 16.1	21 46 39.51	+ 0.08	104 7 31.9	+ 2.0
	13	α Aquarii . . .	9	59 51.80	− 0.95	**− 19.06**	39 43 55.82	+ 3 35.70	+ 47.9	21 59 31.79	+ 0.02	90 54 40.6	+ 0.5
	14	θ Aquarii . . .	9	10 44.79	− 1.11	**− 19.11**	47 11 59.28	+ 3 59.84	+ 1 2.2	22 10 24.62	+ 0.07	98 23 22.5	− 0.3
	15	50 Aquarii . . .	9	18 16.16	− 1.23	− 19.06	53 0 0.48	+ 1 10.60	+ 1 16.3	22 17 55.87	− 4.16	104 8 48.6	+18.3
	16	σ Aquarii . . .	9	24 32.58	− 1.17	− 19.06	50 10 3.69	+ 29.58	+ 1 9.0	22 24 12.35	− 4.10	101 18 3.4	+19.1
	17	η Aquarii . . .	2	29 26.00	− 0.95	**− 19.00**	39 33 58.28	+ 3 34.93	+ 47.7	22 29 5.99	− 0.02	90 44 42.1	+ 0.7
	18	64 Aquarii . . .	9	33 12.02	− 1.17	− 19.06	49 30 0.90	+ 2 11.12	+ 1 7.5	22 32 51.79	− 4.10	100 39 40.8	+20.1
	19	70 Aquarii . . .	5	42 26.18	− 1.18	− 19.06	50 3 59.66	+ 25.33	+ 1 8.8	22 42 5.94	− 4.13	101 11 55.0	+20.8
	20	Mars I, C. . .	6	51 10.58	− 1.18	− 19.06	51 35 54.40	+ 1 41.57	+ 1 12.7	22 50 50.34	+ 0.87	102 45 9.9	. .
	21	Mars II . . .	5	51 12.30	− 1.18	− 19.06	51 38 . .	. .	. .	22 50 52.06	− 0.85	. . . . .	. .
	22	α Pegasi . . .	9	59 1.57	− 0.62	**− 19.09**	24 16 . .	. .	. .	22 58 41.89	+ 0.05	. . . . .	. .
	23	Weisse 1241 .	9	0 15.79	− 1.16	− 19.06	49 5 58.24	+ 2 16.69	+ 1 6.6	22 59 55.57	− 4.13	100 15 42.7	+22.2
	24	Weisse 76 . .	9	6 58.43	− 1.16	− 19.06	49 5 58.24	+ 29.70	+ 1 6.5	23 6 38.21	− 4.13	100 13 55.7	+22.6
	25	ψ² Aquarii . . .	9	11 54.98	− 1.15	− 19.06	48 41 55.98	+ 1 27.84	+ 1 5.6	23 11 34.73	− 4.13	99 50 50.7	+23.0
	26	97 Aquarii . . .	9	16 36.86	− 1.28	− 19.06	54 33 56.28	+ 50.25	+ 1 21.0	23 16 16.52	− 4.24	105 42 28.8	+22.7
	27	θ Piscium . . .	9	22 7.52	− 0.82	**− 19.04**	33 6 . .	. .	. .	23 21 47.63	+ 0.02	. . . . .	. .
25	28	λ Ursæ Minoris .	4	45 42.52	+70.31	− 18.99	309 54 . .	. .	. .	19 46 33.84	− 0.20	. . . . .	. .
	29	τ Aquilæ . . .	9	58 30.81	− 0.82	**− 18.94**	31 52 . .	. .	. .	19 58 11.00	− 0.02	. . . . .	. .
	30	α² Capricorni . .	8	11 37.71	− 1.23	**− 19.02**	51 44 . .	. .	. .	20 11 17.48	+ 0.08	. . . . .	. .
	31	ε Delphini. . .	8	27 43.18	− 0.71	**− 19.05**	27 56 . .	. .	. .	20 27 23.47	+ 0.11	. . . . .	. .
	32	α Cygni . . .	9	37 35.59	+ 0.31	**− 19.02**	353 58 . .	. .	. .	20 37 16.89	+ 0.05	. . . . .	. .
	33	61¹ Cygni . . .	9	1 45.11	+ 0.08	**− 18.98**	0 40 . .	. .	. .	21 1 26 08	− 0.14	. . . . .	. .
	34	ζ Cygni . . .	9	8 4.38	− 0.20	**− 19.02**	9 6 . .	. .	. .	21 7 45.17	+ 0.04	. . . . .	. .
	35	ι Pegasi . . .	9	16 46.70	− 0.49	**− 19.02**	19 32 . .	. . .	. .	21 16 27.19	− 0.06	. . . . .	. .
	36	β Aquarii . . .	9	25 28.96	− 1.04	**− 19.10**	44 54 . .	. .	. .	21 25 8.90	+ 0.09	. . . . .	. .
	37	β Cephei . . .	9	27 22.84	+ 2.77	− 19.02	328 48 . .	. .	. .	21 27 6.59	+ 0.40	. . . . .	. .
	38	ξ Aquarii . . .	9	31 36.22	− 1.10	**− 19.00**	47 12 . . .	. .	. .	21 31 16.10	+ 0.04	. . . . .	. .
	39	ε Pegasi . . .	9	38 31.96	− 0.71	**− 18.97**	29 30 . .	. .	. .	21 38 12.22	− 0.06	. . . . .	. .
P. 26	40	λ Ursæ Minoris .	4	45 45.50	+66.49	− 19.08	309 53 49.25	+ 4 30.00	− 1 7.1	19 46 32.91	+ 0.12	1 3 33.3	+ 0.6
	41	τ Aquilæ . . .	9	58 30.89	− 0.76	**− 19 09**	31 51 54.78	+ 5 1.00	+ 35.1	19 58 11.05	+ 0.04	83 3 52.1	+ 0.4
	42	B. A. C. 6930 .	9	3 30.66	+ 1.48	− 19.08	335 17 45.75	+ 3 48.06	− 25.8	20 3 13.06	− 1.36	26 27 29.2	+20.6
	43	O. Arg. S. 20345	9	8 52.16	− 1.19	− 19 08	53 57 51.42	+ 3 39.11	+ 1 17.5	20 8 31.89	− 3.73	105 9 9.2	+ 5.9
	44	α² Capricorni . .	9	11 37.72	− 1.15	**− 19.12**	51 43 54.05	+ 3 54.69	+ 1 11.5	20 11 17 47	+ 0.08	102 55 21.4	+ 0.3
	45	Lalande 39210 .	9	18 48.73	− 1.20	− 19.08	54 1 53.05	+ 3 20.16	+ 1 17.8	20 18 28.45	− 3.78	105 12 52.2	+ 6.9
	46	π Capricorni . .	8	20 41.07	− 1.26	**− 19.14**	57 23 53.52	+ 4 59.28	+ 1 28.2	20 20 20.73	+ 0.10	108 36 42.2	+ 0.7
	47	ε Delphini . .	9	27 43.19	− 0.69	**− 19.09**	27 55 51.70	+ 3 50.99	+ 30.0	20 27 23.42	+ 0.07	79 6 33.9	+ 0.5
	48	Lalande 39671¹.	6	29 48.62	− 1.21	− 19.08	54 31 52.48	+ 4 21.59	+ 1 19.3	20 29 28.33	− 3.84	105 43 54.6	+ 7.8
	49	Lalande 39671².	5	29 48.72	− 1.21	− 19.08	54 31 52.48	+ 4 18.11	+ 1 19.3	20 29 28.43	− 3.84	105 43 51.1	+ 7.8
	50	α Cygni . . .	9	37 35.61	+ 0.25	**− 19.00**	353 57 51.88	+ 5 2.68	− 5.9	20 37 16.78	− 0.04	45 9 9.9	+ 1.0

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.31	55.8	52.5
3	30.23	65.5	62.5
8	30.22	63.0	61.0
15	30.22	62.0	59.8
18	30.26	61.5	59.2
26	30.25	60.8	59.0
40	30.15	71.0	69.7

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

No. 1 to 2 + 58.″37
No. 3 to 26 + 57.78
No. 40 to 50 + 58.62

19. One bisection.
20, 50. Four bisections.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
20	− 16.8	. .	− 0.1	− 16.9

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.		s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Oct. 5	1	Venus I, S.	9	14 48.00	− 1.56	− 18.73	58 5 53.75	+ 5 18.22	+ 1 31.6	15 14 27.71	+ 0.53	109 19 4.8	.
S.	2	Venus, N.	.	. . .	. .	.	58 5 53.75	+ 5 2.53	+ 1 31.6	. . . .	. .	109 18 49.1	.
	3	γ Aquilæ	9	40 47.09	− 0.88	− **18.64**	28 29 58.95	+ 4 3.68	+ 31.5	19 40 27.60	+ 0.06	79 40 55.3	+
	4	λ Ursæ Minoris	4	45 17.38	+77.88	− 18.62	309 53 55.38	+ 4 24.62	− 1 9.0	19 46 10.64	− 3.74	1 3 32.2	+
	5	O. Arg. S. 20345	9	8 51.96	− 1.51	− 18.62	53 57 55.40	+ 3 33.37	+ 1 19.8	20 8 31.83	− 3.60	105 9 9.8	+
	6	O. Arg. S. 20392	.	. . .	. .	. .	53 27 55.25	+ 4 42.39	+ 1 18.4	. . . .	. .	104 40 17.2	+ 6
	7	Lalande 39140	9	16 56.22	− 1.49	− 18.63	53 27 55.25	+ 3 16.29	+ 1 18.4	20 16 36.10	− 3.63	104 38 51.1	+ 6
	8	Lalande 39210	.	. . .	. .	. .	54 1 53.88	+ 3 15.00	+ 1 20.0	. . . .	. .	105 12 50.1	+ 6
	9	O. Arg. S. 20541	.	. . .	. .	. .	54 15 51.90	+ 4 17.94	+ 1 20.8	. . . .	. .	105 27 51.8	+ 6
	10	Lalande 39486	.	. . .	. .	. .	52 59 57.52	+ 3 37.34	+ 1 17.1	. . . .	. .	104 11 13.2	+ 7
	11	Weisse 664	.	. . .	. .	. .	53 40 2.28	+ 3 53.20	+ 1 19.2	. . . .	. .	104 51 35.9	+ 7
	12	Lalande 39671^1	.	. . .	. .	. .	54 31 57.22	+ 4 12.87	+ 1 21.6	. . . .	. .	105 43 52.9	+ 7
	13	Lalande 39671^2	.	. . .	. .	. .	54 31 57.22	+ 4 9.84	+ 1 21.6	. . . .	. .	105 43 49.9	+ 7
	14	μ Aquarii	7	46 24.80	− 1.36	− **18.68**	48 13 56.98	+ 5 0.35	+ 1 5.3	20 46 4.80	+ 0.11	99 26 23.8	− 0
	15	ν Cygni	7	52 56.40	+ 0.09	− **18.66**	358 7 53.02	+ 3 44.04	− 1.8	20 52 37.85	0.00	49 17 56.5	+ 1
	16	ε Pegasi	9	38 31.65	− 0.90	− **18.57**	29 29 57.62	+ 4 6.81	+ 33.1	21 38 12.10	− 0.08	80 40 58.7	+ 2
	17	μ Capricorni	9	46 59.46	− 1.47	− **18.65**	52 55 56.05	+ 3 58.25	+ 1 17.4	21 46 39.34	0.00	104 7 32.9	+ 2
	18	α Piscis Aust.	9	51 16.26	− 1.92	− **18.68**	69 4 . .	. .	. .	22 50 55.67	+ 0 02	. . . .	.
	19	α Pegasi	9	59 1.28	− 0.74	− **18.71**	24 16 . .	. .	. .	22 58 41.86	+ 0.05	. . . .	.
	20	θ Piscium	8	22 7.33	− 0.96	− **18.71**	33 6 . .	. .	. .	23 21 47.69	+ 0.08	. . . .	.
	21	ι Piscium	9	34 1.08	− 0.98	− **18.66**	33 50 . .	. .	. .	23 33 41.41	− 0 06	. . . .	.
	22	α Andromedæ	9	2 24.81	− 0.31	− **18.63**	10 24 . .	. .	. .	0 2 5.80	− 0.04	. . . .	.
	23	γ Pegasi	9	7 17.63	− 0.72	− **18.74**	24 18 . .	. .	. .	0 6 58.21	+ 0.05	. . . .	.
F. 6	24	Lalande 39486	5	25 26.12	− 1.50	− 18.85	52 59 59.68	+ 3 37.00	+ 1 17.9	20 25 5 77	− 3.64	104 11 15.8	+ 7.
	25	Weisse 664	9	28 17.61	− 1.51	− 18.85	53 39 51.08	+ 4 1.70	+ 1 19.9	20 27 57.25	− 3.68	104 51 36.9	+ 7.
	26	μ Aquarii	8	46 25.06	− 1.38	− 18.85	48 13 52.58	+ 5 6.17	+ 1 6.0	20 46 4.83	+ 0.15	99 26 26.0	+ 1.
	27	61^1 Cygni	9	1 44.88	− 0.05	− **18.81**	0 39 57.32	+ 4 31.04	+ 0.8	21 1 25.98	− 0.05	51 50 50.4	+ 0.
	28	ζ Cygni	5	8 4.21	− 0.36	− **18.85**	9 6 . .	. .	. .	21 7 44.99	+ 0.02	. . . .	.
	29	r Pegasi	9	16 46.57	− 0.66	− **18.85**	19 29 55.12	+ 6 17.28	+ 21.0	21 16 27.05	− 0 07	70 42 54.6	+ 2.
	30	β Aquarii	9	25 28.93	− 1.30	− **18.92**	44 53 58.85	+ 5 7.23	+ 58.9	21 25 8.77	+ 0.07	96 6 26.2	+ 2.
	31	β Cephei	5	27 21.97	+ 2.75	− 18.86	328 47 59.60	+ 4 34.23	− 35.7	21 27 5.86	+ 0.17	19 58 19.3	− 0.
	32	ε Pegasi	9	38 31.92	− 0.93	− **18.82**	29 29 57.60	+ 4 5.76	+ 33.5	21 38 12.13	− 0.04	80 40 58.1	+ 2.
	33	79 Draconis	5	51 38.08	+ 3.56	− 18.87	325 41 55.48	+ 4 45.38	− 40.2	21 51 22.77	+ 0.59	16 52 21.9	+ 1.
	34	θ Aquarii	9	10 44.75	− 1.35	− **18.91**	47 11 56.82	+ 4 1.46	+ 1 3.9	22 10 24.53	+ 0.06	98 23 23.4	+ 0.
	35	50 Aquarii	9	18 16.20	− 1.49	− 18 87	53 0 0.41	+ 1 9.25	+ 1 18.4	22 17 55.84	− 4.08	104 8 49.2	+17.
	36	σ Aquarii	9	24 32.48	− 1.42	− 18.87	50 10 0.48	+ 32.01	+ 1 10.8	22 24 12.19	− 4.04	101 18 4.5	+19.
	37	64 Aquarii	9	33 12.03	− 1.40	− 18.88	49 30 2.58	+ 2 8.33	+ 1 9.2	22 32 51.75	− 4.05	100 39 41.4	+20.
	38	Mars I, C.	4	47 4.65	− 1.44	− 18.88	50 57 59.61	+ 2 8.22	+ 1 13.0	22 46 44.33	+ 0.83	102 7 42.0	.
	39	Mars II	5	47 6.26	− 1.44	− 18.88	50 58 . .	. .	. .	22 46 45.94	− 0.78	. . . .	.
	40	α Piscis Aust.	6	51 16.48	− 1.93	− **18.90**	69 4 . .	. .	. .	22 50 55.67	+ 0.03	. . . .	.
	41	α Pegasi	9	59 1.50	− 0.79	− **18.88**	24 15 54.78	+ 4 14.15	+ 26.8	22 58 41.83	+ 0.02	75 26 56.9	+ 1.
	42	Weisse 1241	2	0 15.94	− 1.40	− 18.88	49 5 58.01	+ 2 15.07	+ 1 8.4	22 59 55.66	− 4.10	100 15 42.6	+21.
	43	Weisse 76	9	6 58.42	− 1.39	− 18.88	49 5 58.01	+ 29.34	+ 1 8.3	23 6 38.15	− 4 11	100 13 56.8	+22.
	44	ψ^2 Aquarii	9	11 55.11	− 1.38	− 18.88	48 42 0.24	+ 1 22.10	+ 1 7.4	23 11 34.85	− 4.11	99 50 50 9	+22.
	45	97 Aquarii	9	16 37.07	− 1.54	− 18.88	54 35 58.04	− 1 12.52	+ 1 23.1	23 15 16.65	− 4.23	105 42 29.8	+22.
	46	α Andromedæ	7	2 25.05	− 0.40	− **18.78**	10 24 . .	. .	. .	0 2 5.76	− 0.08	. . . .	.
	47	γ Pegasi	7	7 17.87	− 0.79	− **18.91**	24 18 . .	. .	. .	0 6 58.18	+ 0.02	. . . .	.
	48	β Ceti	8	37 49.78	− 1.61	− **18.99**	57 28 . .	. .	. .	0 37 29.27	+ 0.15	. . . .	.
	49	32^1 Camelop., s. p.	5	48 33.55	−15.08	− 18.91	302 55 57.20	+ 4 5.43	− 1 31.1	12 47 59.56	+ 6.55	354 4 52.7	+20
	50	32^2 Camelop., s. p.	5	48 41.05	−15.08	− 18.91	302 55 57.20	+ 3 47.31	− 1 31.1	12 48 7.06	− 0.89	354 4 34.6	+ 3

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	29.96	62.2	60.6
4	30.06	55.8	53.8
15	30.09	53.6	51.7
24	30.36	54.5	52.2
33	30.38	53.2	49.2
35	30.39	53.2	49.2
45	30.40	52.0	48.4

For summary of the elements of reduction see page 3.

12, 13, 29. One bisection.
4. Three bisections.
35, 37, 38, 43. Four bisections.

ZENITH-POINT CORR.

		″
No. 1 to 2	+	58.80
No. 3 to 17	+	58.42
No. 24 to 50	+	57.48

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 6.5	− 8.0	+ 0.3	− 14.
2	− 6.5	+ 8:0	. .	+ 1.
38	− 15.0	. .	− 0.2	− 15.

TE ID 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
6	1	ε Piscium . . .	9	56 57.58	− 0.97	**− 18.90**	31 33 56.60	+ 4 59.07	+ 36.6	0 56 37.70	− 0.02	82 45 53.5	+ 0.7
	2	Polaris . . .	5	13 50.78	+60.37	− 18.91	310 9 59.95	+ 5 18.19	− 1 10.0	1 14 32.24	− 0.35	1 20 29.3	+ 0.6
9	3	64 Aquarii . . .	.	. . .	. .	. .	49 30 0.11	+ 2 11.28	+ 1 8.2	. . . .	. .	100 39 40.8	+19.6
	4	70 Aquarii . . .	.	. . .	. .	. .	50 3 58.95	+ 25.39	+ 1 9.6	. . . .	. .	101 11 55.1	+20.2
	5	Mars, C. . .	.	. . .	. .	. .	50 41 57.91	+ 2 3.84	+ 1 11.2	. . . .	. .	101 51 34.2	. .
	6	Weisse 1241 . .	.	. . .	. .	. .	49 5 57.14	+ 2 16.51	+ 1 7.5	. . . .	. .	100 15 42.4	+21.7
	7	Weisse 76 . . .	.	. . .	. .	. .	49 5 57.14	+ 30.55	+ 1 7.3	. . . .	. .	100 13 56.2	+22.1
10	8	λ Ursæ Minoris .	2	45 12.65	+80.46	− 19.38	309 54 . .	. .	. .	19 46 13.73	− 0.33	. . . .	. .
	9	α^2 Capricorni . .	9	11 38.02	− 1.41	**− 19.37**	51 43 56.90	+ 3 52 33	+ 1 12.0	20 11 17.23	+ 0.05	102 55 22.6	+ 1.2
	10	π Capricorni . .	9	20 41.42	− 1.56	**− 19.39**	57 23 55.70	+ 4 58.23	+ 1 28.8	20 20 20.48	+ 0.05	108 36 43.9	+ 1.8
11	11	61^1 Cygni . . .	9	1 45.58	− 0.05	**− 19.60**	0 40 0.28	+ 4 25.85	+ 0.8	21 1 25.89	− 0.05	51 50 48.1	− 1.0
	12	ζ Cygni . . .	9	8 4.83	− 0.33	**− 19.58**	9 5 51.28	+ 3 49.92	+ 9.4	21 7 44.86	− 0.03	60 16 11.8	− 1.0
	13	ι Pegasi . .	9	16 47.28	− 0.61	**− 19.67**	19 31 52.92	+ 4 17.97	+ 20.8	21 16 27.03	− 0.03	70 42 52.9	+ 1.0
	14	ι Draconis, S. P. .	9	20 1 90	−10.36	− 19.64	300 43 55.78	+ 2 58.94	− 1 37.5	9 19 31.90	+ 0.66	351 51 38.4	− 0.6
	15	β Aquarii . . .	5	25 29.50	− 1.19	**− 19.66**	44 54 . .	. .	. .	21 25 8.67	+ 0.03	. . . .	. .
	16	ξ Aquarii . . .	9	31 36.89	− 1.22	**− 19.72**	47 11 54.00	+ 4 43.18	+ 1 3.0	21 31 16.03	+ 0.14	98 24 1.4	0.0
	17	ε Pegasi . . .	9	38 32.59	− 0.85	**− 19.63**	29 29 56.08	+ 4 5.31	+ 33.1	21 38 12.10	− 0.01	80 40 55.7	0.0
	18	11 Cephei . . .	9	40 25.42	+ 2.69	− 19.64	328 5 49.48	+ 3 13.87	− 36.2	21 40 8.47	− 0.15	19 14 48.4	− 1 7
	19	ο Cephei . . .	9	13 56.21	+ 2.10	− 19.64	331 23 50.62	+ 3 31.72	− 31.8	23 13 38.67	− 0.03	22 33 11.7	− 1.5
	20	θ Piscium . . .	9	22 8.24	− 0.91	**− 19.69**	33 5 52.05	+ 4 30.83	+ 38.1	23 21 47.69	+ 0.10	84 17 22.2	+ 2.1
	21	ι Piscium . . .	9	34 2.00	− 0.94	**− 19.63**	33 49 54.98	+ 5 2.22	+ 39.2	23 33 41.42	− 0.04	85 1 57.6	− 0.8
	22	ω Piscium . . .	9	53 24.33	− 0.91	**− 19.68**	32 37 50.72	+ 3 45.59	+ 37.5	23 53 3.79	+ 0.05	83 48 35.0	− 0.9
	23	α Andromedæ .	9	2 25.78	− 0.36	**− 19.54**	10 23 50.22	+ 4 26.92	+ 10.8	0 2 5.79	− 0.06	61 34 49.1	− 0.8
	24	4 Draconis, S. P. .	7	6 52.23	− 7.51	− 19.63	297 10 . .	. .	. .	12 6 25.09	+ 0.43	. . . .	. .
12	25	Moon S. . .	.	. . .	. .	. .	67 23 57.08	+ 5 6.21	+ 2 18.7	. . . .	. .	118 37 43.2	. .
	26	d Sagittarii . .	9	10 50.97	− 1.41	**− 20 04**	57 57 55.58	+ 4 24.95	+ 1 32.7	19 10 29.51	+ 0.02	109 10 14.4	+ 4.8
	27	δ Aquilæ . . .	7	19 41.48	− 0.87	**− 20.02**	35 55 58.08	+ 4 37.07	+ 42.2	19 19 20.56	+ 0.04	87 7 38.6	+ 2.6
	28	κ Aquilæ . . .	7	30 40.70	− 1.11	**− 20.09**	46 5 59.10	+ 4 32.37	+ 1 0.5	19 30 19.55	+ 0.09	97 17 53.2	+ 2.3
	29	γ Aquilæ . . .	9	40 48.13	− 0.70	**− 19.98**	28 29 58.98	+ 4 4.10	+ 31.7	19 40 27.39	− 0.03	79 40 56.0	+ 1.4
	30	λ Ursæ Minoris .	5	45 12.54	+78.30	− 20.03	309 53 55.50	+ 4 25.48	− 1 9.3	19 46 10.81	− 0.43	1 3 32 9	+ 2.2
	31	τ Aquilæ . . .	9	58 31.57	− 0.78	**− 20.00**	31 52 0.42	+ 4 55.39	+ 36.3	19 58 10.76	0.00	83 3 53.3	+ 1.9
	32	α^2 Capricorni . .	9	11 38.56	− 1.26	**− 20.10**	51 43 53.58	+ 3 53.87	+ 1 13.9	20 11 17.28	+ 0.14	102 55 22.5	+ 1.1
	33	O. Arg. S. 20407	9	13 22.60	− 1.33	− 20.02	54 11 58.18	+ 4 10.10	+ 1 20.8	20 13 1.25	− 3.52	105 23 56.3	+ 5.8
	34	Lalande 39210 .	9	18 49.59	− 1.32	− 20.01	54 1 53.12	+ 3 16.98	+ 1 20.3	20 18 28.26	− 3.55	105 12 51.6	+ 6.4
	35	O. Arg. S. 20541	9	22 33.44	− 1.34	− 20.01	54 17 52.85	+ 2 17.76	+ 1 21.1	20 22 12.09	− 3.57	105 27 52.9	+ 6.7
	36	Lalande 39579 .	9	27 45.86	− 1.31	− 20.01	52 55 59.45	+ 4 46.71	+ 1 17.3	20 27 24.54	− 3.56	104 8 24.7	+ 7.6
	37	ν Cygni . . .	9	52 57.47	+ 0 15	**− 19.94**	358 7 52.28	+ 3 45.67	− 1.8	20 52 37.62	− 0.02	49 17 57.4	+ 2.8
	38	61^1 Cygni . . .	9	1 45.76	+ 0.11	**− 19.96**	0 39 55.88	+ 4 32.85	+ 0.8	21 1 25.88	− 0.04	51 50 50.7	+ 1.8
	39	ζ Cygni . . .	9	8 5.01	− 0.19	**− 19.92**	9 5 53.25	+ 3 50.47	+ 9.4	21 7 44.83	− 0.04	60 16 14.3	+ 1.6
	40	ι Pegasi . . .	9	16 47.44	− 0.51	**− 19.95**	19 31 56.15	+ 4 16.94	+ 20.8	21 16 26.94	− 0.10	70 42 55.1	+ 3.2
	41	ξ Aquarii . . .	9	31 37.22	− 1.18	**− 20.10**	47 11 58.70	+ 4 36.68	+ 1 3.2	21 31 16.06	+ 0.18	98 23 59.8	− 1.6
	42	α Aquarii . . .	9	59 52.71	− 1.02	**− 20.04**	39 43 51.90	+ 3 39.32	+ 48.7	21 59 31.71	+ 0.08	90 54 41.1	+ 1.2
	43	50 Aquarii . . .	9	18 17.21	− 1.34	− 19.98	52 59 57.80	+ 1 12.71	+ 1 17.7	22 17 55.89	− 4.03	104 8 49.4	+17.4
	44	σ Aquarii . . .	9	24 33.59	− 1.27	− 19.98	50 10 0.98	+ 32.55	+ 1 10.2	22 24 12.34	− 3.99	101 18 5.0	+18.7
	45	64 Aquarii . . .	9	33 13.01	− 1.27	− 19.98	49 30 0.11	+ 2 11.79	+ 1 8.7	22 32 51.76	− 4.00	100 39 41.8	+19.5
	46	70 Aquarii . . .	9	42 27.22	− 1.28	− 19.98	50 3 59.12	+ 25.58	+ 1 10.3	22 42 5.96	− 4.04	101 11 56.2	+20.1
	47	Mars I, C. . .	4	47 43.53	− 1.29	− 19.98	50 24 0.52	+ 1 25.13	+ 1 11.3	22 47 22.26	+ 0.85	101 32 58.1	. .
	48	Mars II . . .	5	47 45.16	− 1.29	− 19.98	50 24 . .	. .	. .	22 47 23.89	− 0.78	. . . .	. .
	49	Weisse 1241 .	8	0 16.78	− 1.27	− 19.97	49 5 57.39	+ 2 15.93	+ 1 8.1	22 59 55.54	− 4.07	100 15 42.6	+21.5
	50	Weisse 76 . .	9	6 59.47	− 1.27	− 19.97	49 5 57.39	+ 29.99	+ 1 8.1	23 6 38.23	− 4.08	100 13 56.6	+22.0

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.40	50.5	47.5
30.15	52.8	52.4
30.15	52.3	51.4
30.00	63.9	62.8
30.05	52.5	51.0
30.05	52.0	49.5
30.15	57.0	56.0
30.16	55.2	52.5
30.18	54.0	51.2
30.17	52.0	49.0
30.19	51.2	47.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	° ′ ″
5	− 14.5	. .	− 0.2	− 14 7
25	−51 14.1	− 15 10.7	. .	− 1 6 24.8
47	− 14.0	− 0.3	. .	− 14.2

9, 36, 37, 39. One bisection.
5, 7, 25. Three bisections.
2, 3, 4, 6, 44, 45, 46, 47, 49, 50. Four bisections.
30. Five bisections.

ZENITH-POINT CORR.

	″
No. 1 to 2	+ 57.48
No. 3 to 7	+ 57.60
No. 9 to 10	+ 56.88
No. 11 to 23	+ 56.82
No. 25 to 50	+ 58.24

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Sept. 26	1	μ Aquarii	9	46 25.06	− 1.08	− **19.10**	48 13 53.10	+ 5 8.20	+ 1 3 4	20 46 4.90	+ 0.09	99 26 25.9	+ 1
P.	2	B. A. C. 7326	6	59 37.54	+ 0.10	− 19.07	357 39 54.08	+ 4 52.61	− 2.2	20 59 18.57	− 2.75	48 51 5.7	+22
	3	ζ Cygni	9	8 4.40	− 0.25	− 19.07	9 5 50.98	+ 3 54.05	+ 9.1	21 7 45.08	− 0.04	60 16 15.3	+ 0
	4	B. A. C. 7643 (R.)	.	. . .	. .	. .	197 3 52.85	+ 4 21.39	+ 17.5	. . . .	. .	33 57 49.5	+24
	5	B. A. C. 7643	.	. . .	. .	. .	342 47 52.60	+ 3 55 17	+ 17.5	. . . .	. .	33 57 51.5	+24
	6	θ Aquarii (R.)	.	. . .	. .	. .	132 39 57.88	+ 4 0.54	− 1 1.4	. . . .	. .	98 23 24.2	+ 1
	7	θ Aquarii	.	. . .	. .	. .	47 11 53 15	+ 4 8.05	+ 1 1.4	. . . .	. .	98 23 23.8	+ 1
	8	50 Aquarii	9	18 16.16	− 1.19	− 19.07	52 59 55.68	+ 1 17.31	+ 1 15.3	22 17 55.90	. .	104 8 49.5	+18
	9	σ Aquarii	9	24 32.60	− 1.14	− 19.07	50 9 56.78	+ 38.43	+ 1 8.1	22 24 12.39	− 4.09	101 18 4.5	+19
	10	64 Aquarii	9	33 11.96	− 1.12	− 19 07	49 29 57.66	+ 2 15.85	+ 1 6.6	22 32 51.77	− 4.10	100 39 41.3	+20
	11	70 Aquarii	9	42 26.16	− 1.14	− 19.07	50 3 55.90	+ 30.77	+ 1 7.9	22 42 5.05	− 4.12	101 11 55.8	+20
	12	Mars I, C.	6	50 1.17	− 1.17	− 19.07	51 31 54.70	+ 2 36.26	+ 1 11.6	22 49 40.93	+ 0.81	102 42 3.8	.
	13	Mars II	5	50 2.76	− 1.17	− 19.07	51 32 . .	. . .	. .	22 49 42.52	− 0.78	. . . .	.
	14	Weisse 1241	9	0 15.73	− 1.12	− 19.07	49 5 54.92	+ 2 21.09	+ 1 5.8	23 59 55.54	− 4.12	100 15 43.0	+22.
	15	Weisse 76	8	6 58.36	− 1.12	− 19.06	49 5 54.92	+ 34.48	+ 1 5.7	23 6 38.18	− 4.13	100 13 56.3	+22.
	16	ψ² Aquarii	.	. . .	. .	. .	48 41 54.72	+ 1 30.09	+ 1 4.8	. . . .	. .	99 50 50.9	+23.
	17	97 Aquarii	9	16 36.88	− 1.23	− 19.06	54 33 54.65	+ 52.55	+ 1 20.0	23 16 16.59	− 4.24	105 42 28.4	+22.
	18	Weisse (2) 1027	9	50 49.00	− 0.47	− 19.06	16 49 56.55	+ 5 9.81	+ 17.4	23 50 29.47	− 3 86	68 1 45.0	+26.
	19	α Andromedæ	9	2 25.13	− 0.31	− **18.98**	10 23 53.65	+ 4 28 46	+ 10.5	0 2 5.76	− 0.05	61 34 53 8	+ 1.
	20	γ Pegasi	9	7 17 79	− 0.63	− **19.02**	24 17 52.35	+ 4 55.96	+ 25.9	0 6 58.10	− 0.03	75 29 35.4	+ 1.
	21	Weisse (2) 296	9	12 36.23	− 0.24	− 19.06	7 57 54.55	+ 5 8 45	+ 8.0	0 12 16.93	− 3.93	59 9 32.2	+25.
	22	Lalande 512.	5	19 29 86	− 0.90	− 19.06	37 33 58.28	+ 2 58.61	+ 44.0	0 19 9.90	− 4.01	88 44 2.1	+26.
	23	B. A. C. 123	9	25 48.39	+ 0.63	− 19.06	345 41 55.80	+ 3 25.44	− 14.5	0 25 29.96	− 4.29	36 51 27.9	+23.
	24	β Ceti	9	37 49.53	− 1.28	− **19.13**	57 27 56.15	+ 3 28.65	+ 1 29.5	0 37 29.19	+ 0.13	108 39 15.5	0.
	25	32¹ Camelop., S. P.	5	48 22.30	−12.77	− 19.06	302 55 53.88	+ 4 9.75	− 1 27.7	12 48 0.47	+ 6.36	354 4 57.1	+16.
	26	32² Camelop., S. P.	5	48 39.86	−12.77	− 19.06	302 55 53.88	+ 3 51.15	− 1 27.7	12 48 8.03	− 0.12	354 4 38.5	+ 3.
	27	β Andromedæ	9	3 14.18	− 0.12	− 19.06	3 51 55.10	+ 3 10.91	+ 3.9	1 2 55.00	− 4.12	55 1 31 1	+24.
	28	Polaris	5	13 57.88	+50.78	− 19.05	310 9 56.85	+ 5 23.03	− 1 7.4	1 14 29.61	− 0.75	1 20 33 7	+ 1.
	29	η Piscium	9	25 17.93	− 0.64	− **19.10**	24 6 . .	. . .	. .	1 24 58.24	+ 0.13	. . . .	
Oct. 1	30	γ Aquilæ	9	10 47.09	− 0.53	− **18.93**	28 29 58.05	+ 4 6.80	+ 30.8	19 40 27.76	+ 0.16	79 40 56.8	+ 2.
F.	31	α Aquilæ	9	45 9.39	− 0.57	− **18.91**	30 16 . .	. . .	. .	19 44 50.01	+ 0.14	. . . .	.
	32	λ Ursæ Minoris	5	45 41.36	+59.65	− 18.81	309 54 . .	. . .	. .	19 46 22.20	− 3.53	. . . .	.
	33	τ Aquilæ	9	58 30.51	− 0.60	− **18.94**	31 51 54.62	+ 5 1.22	+ 35.3	19 58 11.10	+ 0.16	83 3 52.3	+ 0.
	34	O. Arg. S. 20407	9	13 21.41	− 0.98	− 18.82	54 11 51.82	+ 4 23.36	+ 1 18.6	20 13 1.61	− 3 69	105 23 55.0	+ 6.
	35	Lalande 39210	8	18 48.28	− 0.98	− 18.82	54 1 47.40	+ 3 25.13	+ 1 18.2	20 18 28.48	− 3.71	105 12 51.9	+ 6.
	36	Lalande 39247	.	. . .	. .	. .	54 9 47.45	+ 5 11.36	+ 1 18.6	. . . .	. .	105 22 38.6	+ 6.
	37	Lalande 39579	9	27 44.58	− 0.96	− 18.82	52 55 54.75	+ 4 52.27	+ 1 15.2	20 27 21.80	− 3.72	104 8 23.4	+ 7.
	38	Weisse 664	3	28 17.03	− 0.98	− 18.82	53 39 57.85	+ 3 58.27	+ 1 17 2	20 27 57.23	− 3.75	104 51 34.5	+ 7.
	39	α Cygni	9	37 35.12	+ 0.32	− **18 69**	353 57 51.02	+ 5 2.82	− 5.9	20 37 16.61	− 0.10	45 9 9.1	+ 1.
	40	γ Cygni	9	52 56.47	+ 0 17	− **18.74**	358 7 47.62	+ 3 51.60	− 1.8	20 52 37.81	− 0.05	49 17 58.6	+ 2.
	41	61¹ Cygni	9	1 44.72	+ 0.09	− **18.70**	0 39 56.90	+ 4 31.64	+ 0.7	21 1 25.97	− 0.15	51 50 50 4	− 0.
	42	ι Aquarii	9	59 51.43	− 0.71	− **18.95**	30 43 54.48	+ 3 37.61	+ 47.7	21 59 31.83	+ 0.11	90 54 41.0	+ 1.
	43	50 Aquarii	9	18 15.81	− 0.97	− 18.86	52 59 55.31	+ 1 16.52	+ 1 16.0	22 17 55.98	− 4.12	104 8 49.0	+18.
	44	σ Aquarii	9	24 32.23	− 0.92	− 18.87	50 9 57.29	+ 37.78	+ 1 8.6	22 24 12 44	− 4.07	101 18 4.9	+19.
	45	64 Aquarii	9	33 11.67	− 0.91	− 18.87	49 29 55.40	+ 2 17.90	− 1 7.1	22 32 51.89	− 4.07	100 39 41 6	+20.
	46	70 Aquarii	9	42 25.87	− 0.93	− 18.87	50 3 55.41	+ 30.66	+ 1 8.1	22 42 6.07	− 4.10	101 11 55.7	+20.
	47	Mars I, C.	6	47 55.80	− 0.95	− 18.87	51 17 52.28	+ 3 18.39	+ 1 11.6	22 47 35.98	+ 0.86	102 28 43.5	. .
	48	Mars II	5	47 57.48	− 0.95	− 18.87	51 18 . .	. . .	. .	22 47 37.66	− 0.82	. . . .	. .
	49	Weisse 1241	9	0 15.32	− 0.92	− 18.88	49 5 55.55	+ 2 19.12	+ 1 6.2	22 59 55 52	− 4.12	100 15 42.1	+22.
	50	Weisse 76	9	6 58.02	− 0.92	− 18.88	49 5 55.55	+ 33.23	+ 1 6.2	23 6 38.22	− 4.12	100 13 56.1	+22.

No.	Barom.	At. Ther.	Ex. Ther.
	in.		°
2	30.15	69.2	67.4
9	30.14	66.0	64.7
17	30.15	64.5	63.3
19	30.14	63.9	62.7
28	30.14	63.0	61.8
33	30.16	68.6	67.0
42	30.18	64.0	61.5
43	30.17	63.6	61.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	″	′ ″
12	− 16.4	. .	− 0.2	− 16.6
47	− 15.8	. .	− 0.2	− 16.0

ZENITH-POINT CORR.

No. 2 to 28 + 58″.62
No. 30 to 50 + 58.88

33. One bisection.
8, 9, 10, 11, 12, 14, 15, 16, 17, 45, 46, 47. Four bisections.
28. Five bisections.

ATE ND IS'R.	Number.	OBJECT.	Thread.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
t. 14	1	B. A. C. 7643 (R.)	.	. . .	. .	. .	197 3 54.00	+ 4 24.32	+ 17.8	. . . .	. .	33 57 45.1	+28.8
P.	2	B. A. C. 7643	.	. . .	. .	. .	342 47 55.70	+ 3 46.96	− 17.8	. . . .	. .	33 57 46.1	+28.8
	3	θ Aquarii (R.)	.	. . .	. .	. .	132 39 54.65	+ 4 5.01	− 1 2.3	. . . .	. .	98 23 23.8	+ 0.6
	4	θ Aquarii	.	. . .	. .	. .	47 11 53.80	+ 4 6.19	+ 1 2.3	. . . .	. .	98 23 23.5	+ 0.3
	5	50 Aquarii	9	18 17.72	− 1.32	− 20.62	52 59 55.46	+ 1 16.99	+ 1 16.4	22 17 55.78	− 4.01	104 8 50.1	+17.3
	6	σ Aquarii	9	24 34.16	− 1.26	− 20.62	50 9 54.84	+ 40.16	+ 1 9.1	22 24 12.28	− 3.97	101 18 5.3	+18.6
	7	64 Aquarii	9	33 13.59	− 1.23	− 20.63	49 29 54.95	+ 2 18.90	+ 1 7.6	22 32 51.73	− 3.98	100 39 42.6	+19.4
	8	70 Aquarii	7	42 27.75	− 1.25	− 20.63	50 3 54.92	+ 31.85	+ 1 8.9	22 42 5.87	− 4.02	101 11 56.9	+20.0
	9	Mars I, C.	4	48 20.58	− 1.25	− 20.64	50 9 56.24	+ 49.47	+ 1 9.2	22 47 58.69	+ 0.74	101 19 16.2	. .
	10	Mars II	5	48 21.98	− 1.25	− 20.64	50 10 . .	. .	. .	22 48 0.09	− 0.66	. . . .	. .
	11	Weisse 1241	9	0 17.33	− 1.22	− 20.64	49 5 54.70	+ 2 20.90	+ 1 6.8	22 59 55.47	− 4.06	100 15 43.6	+21.4
	12	Weisse 76	9	6 59.98	− 1.22	− 20.65	49 5 54.70	+ 34.42	+ 1 6.7	23 6 38.11	− 4.07	100 13 57.1	+21.9
	13	ψ² Aquarii	9	11 56.57	− 1.21	− 20.65	48 41 54.66	+ 1 28.99	+ 1 5.9	23 11 34.71	− 4.08	99 50 50.7	+22.3
	14	97 Aquarii	9	16 38.51	− 1.35	− 20.65	54 33 53.39	+ 52.85	+ 1 21.3	23 16 16.51	− 4.20	105 42 28.7	+21.3
	15	θ Piscium	9	22 9.14	− 0.84	− **20.67**	33 5 56.85	+ 4 25.50	+ 37.9	23 21 47.65	+ 0.07	84 17 21.5	+ 1.5
	16	γ Cephei (R.)	.	. . .	. .	. .	217 57 51.12	+ 5 0.63	+ 45.3	. . . .	. .	13 2 44.1	− 1.7
	17	γ Cephei	5	34 39.02	+ 5.26	− 20.66	321 53 54.88	+ 3 16.16	− 45.3	23 34 23.62	+ 0.23	13 2 46.9	+ 1.1
	18	Anonymous	9	43 44.18	− 1.29	− 20.67	51 49 53.98	+ 3 52.44	+ 1 13.8	23 43 22.22	− 4.20	103 1 21.4	+23.6
	19	O. Arg. N. 26144	5	48 2.15	+ 3.16	− 20.67	327 59 54.40	+ 5 29 15	− 36.1	23 47 44.64	− 4.57	19 11 8.7	+29.0
	20	ω Piscium	9	53 25.23	− 0.83	− **20.66**	32 37 53.98	+ 3 43.67	+ 37.2	23 53 3.73	− 0.01	83 48 36.0	+ 0.1
	21	α Andromedæ (R.)	.	. . .	. .	. .	169 27 50.85	+ 3 50.46	− 10.7	. . . .	. .	61 34 50.6	+ 1.1
	22	α Andromedæ	.	. . .	. .	. .	10 23 52.65	+ 4 25.35	+ 10.7	. . . .	. .	61 34 49.9	+ 0.4
	23	γ Pegasi	9	7 19.46	− 0.62	− **20.66**	24 17 52.20	+ 4 53.57	+ 26.3	0 6 58.16	− 0.01	75 29 33.3	+ 1.1
	24	12 Ceti	9	24 11.57	− 1.09	− 20.69	43 25 58.15	+ 4 32.27	+ 55.0	0 23 49.79	− 4.14	94 37 46.6	+26.7
	25	B. A. C. 152	9	30 30.08	+ 0.38	− 20.69	355 1 54.85	+ 2 44.80	− 5.0	0 30 9.77	− 4.22	46 10 55.8	+28.9
	26	β Ceti	9	37 51.28	− 1.42	− **20.65**	57 28 1.00	+ 3 23.80	+ 1 30.9	0 37 29.16	+ 0.01	108 39 16.9	− 0.4
	27	Weisse (2) 1062	9	42 54.70	+ 0.23	− 20.70	358 25 50.98	+ 2 39.56	− 1.5	0 42 34.23	− 4.26	49 34 50.2	+28.6
	28	B. A. C. 227	7	43 26.72	+ 0.23	− 20.70	358 25 50.98	+ 2 49.11	− 1.5	0 43 6.25	− 4.26	49 34 59.8	+28.6
	29	ε Piscium	9	56 59.31	− 0.79	− **20.77**	31 33 55.08	+ 5 0.34	+ 35.8	0 56 37.81	+ 0.05	82 45 52.4	+ 0.1
	30	Polaris	5	13 52.44	+62.08	− 20.72	310 9 53.98	+ 5 20.06	− 1 8.5	1 14 33.80	− 0.21	1 20 26.7	+ 1.1
E. 15	31	Moon I, S.	9	3 48.84	− 1.52	− 20.43	58 8 2.88	+ 4 8.99	+ 1 31.7	21 3 26.89	+64.48	109 20 4.8	. .
	32	ζ Cygni	6	8 5.49	− 0.28	− **20.36**	9 5 56.45	+ 3 46.47	+ 9.2	21 7 44.78	− 0.04	60 16 13.3	+ 0.8
	33	ι Pegasi	9	16 47.86	− 0.60	− **20.33**	19 31 58.28	+ 4 14.32	+ 20.3	21 16 26.84	− 0.15	70 42 54.1	+ 2.3
	34	β Aquarii	9	25 30.27	− 1.21	− **20.47**	44 54 1.52	+ 5 6.18	+ 57.0	21 25 8.64	+ 0.06	96 6 25.9	+ 1.8
	35	ξ Aquarii	9	31 37.63	− 1.26	− **20.47**	47 11 54.25	+ 4 46.36	+ 1 1.7	21 31 15.95	+ 0.11	98 24 3.5	+ 2.0
	36	ε Pegasi	9	38 33.28	− 0.85	− **20.36**	29 29 57.08	+ 4 7.08	+ 32.4	21 38 12.02	− 0.05	80 40 57.8	+ 2.3
	37	μ Capricorni	9	47 1.16	− 1.40	− **20.53**	52 55 55.88	+ 4 0.39	+ 1 15.6	21 46 39.35	+ 0.12	104 7 33.1	+ 2.1
	38	50 Aquarii	9	18 17.59	− 1.39	− 20.39	52 59 54.78	+ 1 19.72	+ 1 15.7	22 17 55.81	− 4.00	104 8 51.4	+17.2
	39	σ Aquarii	9	24 33.96	− 1.32	− 20.39	50 9 56.92	+ 39.40	+ 1 8.5	22 24 12.25	− 3.96	101 18 6.0	+18.5
	40	64 Aquarii	9	33 13.40	− 1.31	− 20.38	49 30 0.78	+ 2 12.85	+ 1 6.9	22 32 51.71	− 3.98	100 39 41.7	+19.4
	41	70 Aquarii	9	42 27.54	− 1.32	− 20.37	50 3 53.10	+ 34.75	+ 1 8.2	22 42 5.85	− 4.02	101 11 57.2	+19.9
	42	Mars I, C.	4	48 42.88	− 1.32	− 20.36	50 1 54.88	+ 2 39.14	+ 1 8.1	22 48 21.20	+ 0.76	101 12 3.3	. .
	43	Mars II	5	48 44.32	− 1.32	− 20.36	50 2 . .	. .	. .	22 48 22.64	− 0.68	. . . .	. .
	44	Weisse 1241	9	0 17.09	− 1.30	− 20.36	49 5 54.80	+ 2 21.80	+ 1 6.0	22 59 55.43	− 4.05	100 15 43.8	+21.4
	45	Weisse 76	8	6 59.76	− 1.30	− 20.35	49 5 54.25	+ 35.83	+ 1 6.0	23 6 38.11	− 4.07	100 13 57.2	+21.8
	46	ψ² Aquarii	9	11 56.43	− 1.29	− 20.35	48 41 51.32	+ 1 34.24	+ 1 5.1	23 11 34.79	− 4.07	99 50 51.8	+22.2
	47	97 Aquarii	9	16 38.32	− 1.43	− 20.35	54 33 54.10	+ 53.64	+ 1 20.3	23 16 16.54	− 4.19	105 42 29.2	+21.3
	48	Vesta	9	28 26.96	− 1.41	− 20.34	54 3 51.68	+ 7 5.34	+ 1 19.1	23 28 5.21	. .	105 18 37.3	− 4.6
	49	ω Piscium	9	53 25.01	− 0.91	− **20.36**	32 37 56.02	+ 3 42.18	+ 36.7	23 53 3.77	+ 0.03	83 48 36.1	+ 0.3
	50	α Andromedæ	9	2 26.41	− 0.32	− **20.21**	10 23 53.65	+ 4 25.58	+ 10.6	0 2 5.77	− 0.08	61 34 51.0	+ 1.7

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.30	61.2	60.0
30.30	59.0	57.8
30.30	57.4	56.7
30.26	66.5	65.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	″	° ′ ″
9	− 13.6	. .	− 0.3	− 13.9
31	−45 58.2	− 14 48.8	. .	− 1 0 47.0
42	− 13.5	. .	− 0.3	− 13.7

ZENITH-POINT CORR.

No. 1 to 30	+ 61.″44
No. 31 to 50	+ 60.72

31. Three bisections.
30. Five bisections.
5, 6, 7, 11, 12, 13, 14, 38, 39, 40, 41, 44, 46. } Four bisections.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.		s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Oct. 5 S.	1	Venus I, S. . .	9	14 48.00	− 1.56	− 18.73	58 5 53.75	+ 5 18.22	+ 1 31.6	15 14 27.71	+ 0.53	109 19 4.8	.
	2	Venus, N. . . .	.	. . .	. .	. .	58 5 53.75	+ 5 2.53	+ 1 31.6	. . . .	. .	109 18 49.1	.
	3	γ Aquilæ . . .	9	40 47.09	− 0.88	− **18.64**	28 29 58.95	+ 4 3.68	+ 31.5	19 40 27.60	+ 0.06	79 40 55.3	+
	4	λ Ursæ Minoris .	4	45 17.38	+77.88	− 18.62	309 53 55.38	+ 4 24.62	− 1 9.0	19 46 10.64	− 3.74	1 3 32.2	+
	5	O. Arg. S. 20345	9	8 51.96	− 1.51	− 18.62	53 57 55.40	+ 3 33.37	+ 1 19.8	20 8 31.83	− 3.60	105 9 9.8	+
	6	O. Arg. S. 20392 .	.	. . .	. .	. .	53 27 55.25	+ 4 42.39	+ 1 18.4	. . . .	. .	104 40 17.2	+
	7	Lalande 39140 .	9	16 56.22	− 1.49	− 18.63	53 27 55.25	+ 3 16.29	+ 1 18.4	20 16 36.10	− 3.63	104 38 51.1	+
	8	Lalande 39210 .	.	. . .	. .	. .	54 1 53.88	+ 3 15.00	+ 1 20.0	. . . .	. .	105 12 50.1	+
	9	O. Arg. S. 20541	.	. . .	. .	. .	54 15 51.90	+ 4 17.94	+ 1 20.8	. . . .	. .	105 27 51.8	+
	10	Lalande 39486 .	.	. . .	. .	. .	52 59 57.52	+ 3 37.34	+ 1 17.1	. . . .	. .	104 11 13.2	+ 7
	11	Weisse 664 . .	.	. . .	. .	. .	53 40 2.28	+ 3 53.20	+ 1 19.2	. . . .	. .	104 51 35.9	+ 7
	12	Lalande 39671¹ .	.	. . .	. .	. .	54 31 57.22	+ 4 12.87	+ 1 21.6	. . . .	. .	105 43 52.9	+ 7
	13	Lalande 39671² .	.	. . .	. .	. .	54 31 57.22	+ 4 9.84	+ 1 21.6	. . . .	. .	105 43 49.9	+ 7
	14	μ Aquarii . . .	7	46 21.80	− 1.36	− **18.68**	48 13 56.98	+ 5 0.35	+ 1 5.3	20 46 4.80	+ 0.11	99 26 23.8	− 0
	15	ν Cygni . . .	7	52 56.40	+ 0.09	− **18.66**	358 7 53.02	+ 3 44.04	− 1.8	20 52 37.85	0.00	49 17 56.5	+ 1
	16	ε Pegasi . . .	9	38 31.65	− 0.90	− **18.57**	29 29 57.62	+ 4 6.81	+ 33.1	21 38 12.10	− 0.08	80 40 58.7	+ 2
	17	μ Capricorni . .	9	46 59.46	− 1.47	− **18.65**	52 55 56.05	+ 3 58.25	+ 1 17.4	21 46 39.34	0.00	104 7 32.9	+ 2
	18	α Piscis Aust. .	9	51 16.26	− 1.92	− **18.68**	69 4 . .	. .	. .	22 50 55.67	+ 0 02	. . . .	.
	19	α Pegasi . . .	9	59 1.28	− 0.74	− **18.71**	24 16 . .	. .	. .	22 58 41.86	+ 0.05	. . . .	.
	20	θ Piscium . . .	8	22 7.33	− 0.96	− **18.71**	33 6 . .	. .	. .	23 21 47.69	+ 0.08	. . . .	.
	21	ι Piscium . . .	9	34 1.08	− 0.98	− **18.66**	33 50 . .	. .	. .	23 33 41.41	− 0 06	. . . .	.
	22	α Andromedæ .	9	2 24.81	− 0.31	− **18.63**	10 24 . .	. .	. .	0 2 5.80	− 0.04	. . . .	.
	23	γ Pegasi . . .	9	7 17.63	− 0.72	− **18.74**	24 18 . .	. .	. .	0 6 58.21	+ 0.05	. . . .	.
F. 6	24	Lalande 39486 .	5	25 26.12	− 1.50	− 18.85	52 59 59.68	+ 3 37.00	+ 1 17.9	20 25 5 77	− 3.64	104 11 15.8	+ 7
	25	Weisse 664 . .	9	28 17.61	− 1.51	− 18.85	53 39 51.08	+ 4 1.70	+ 1 19.9	20 27 57.25	− 3.68	104 51 36.9	+ 7
	26	μ Aquarii . . .	8	46 25.06	− 1.38	− 18.85	48 13 52.58	+ 5 6.17	+ 1 6.0	20 46 4.83	+ 0.15	99 26 26.0	+ 1
	27	61¹ Cygni . . .	9	1 44.88	− 0.05	− **18.81**	0 39 57.32	+ 4 31.04	+ 0.8	21 1 25.98	− 0.05	51 50 50.4	+ 0
	28	ζ Cygni . . .	5	8 4.21	− 0.36	− **18.85**	9 6 . .	. .	. .	21 7 44.99	+ 0.02	. . . .	.
	29	r Pegasi . . .	9	16 46.57	− 0.66	− **18.85**	19 29 55.12	+ 6 17.28	+ 21.0	21 16 27.05	− 0 07	70 42 54.6	+ 2
	30	β Aquarii . . .	9	25 28.93	− 1.30	− **18.92**	44 53 58.85	+ 5 7.23	+ 58.9	21 25 8.77	+ 0.07	96 6 26.2	+ 2
	31	β Cephei . . .	5	27 21.97	+ 2.75	− 18.86	328 47 59.60	+ 4 34.23	− 35.7	21 27 5.86	+ 0.17	19 58 19.3	− 0
	32	ε Pegasi . . .	9	38 31.92	− 0.93	− **18.82**	29 29 57.60	+ 4 5.76	+ 33.5	21 38 12.13	− 0.04	80 40 58.1	+ 2
	33	79 Draconis . .	5	51 38.08	+ 3.56	− 18.87	325 41 55.48	+ 4 45.38	− 40.2	21 51 22.77	+ 0.59	16 52 21.9	+ 1
	34	θ Aquarii . . .	9	10 44.75	− 1.35	− **18.91**	47 11 56.82	+ 4 1.46	+ 1 3.9	22 10 24.53	+ 0.06	98 23 23.4	+ 0
	35	50 Aquarii . . .	9	18 16.20	− 1.49	− 18 87	53 0 0.41	+ 1 9.25	+ 1 18.4	22 17 55.84	− 4.08	104 8 49.2	+17
	36	σ Aquarii . . .	9	24 32.48	− 1.42	− 18.87	50 10 0.48	+ 32.01	+ 1 10.8	22 24 12.19	− 4.04	101 18 4.5	+19
	37	64 Aquarii . . .	9	33 12.03	− 1.40	− 18.88	49 30 2.58	+ 2 8.33	+ 1 9.2	22 32 51.75	− 4.05	100 39 41.4	+20
	38	Mars I, C. . .	4	47 4.65	− 1.44	− 18.88	50 57 59.61	+ 2 8.22	+ 1 13.0	22 46 44.33	+ 0.83	102 7 42.0	.
	39	Mars II . . .	5	47 6.26	− 1.44	− 18.88	50 58 . .	. .	. .	22 46 45.91	− 0.78	. . . .	.
	40	α Piscis Aust. .	6	51 16.48	− 1.93	− **18.90**	69 4 . .	. .	. .	22 50 55.67	+ 0.03	. . . .	.
	41	α Pegasi . . .	9	59 1.50	− 0.79	− **18.88**	24 15 54.78	+ 4 14.15	+ 26.8	22 58 41.83	+ 0.02	75 26 56.9	+ 1
	42	Weisse 1241 .	2	0 15.94	− 1.40	− 18.88	49 5 58.01	+ 2 15.07	+ 1 8.4	22 59 55.66	− 4.10	100 15 42.6	+21
	43	Weisse 76 . .	9	6 58.42	− 1.39	− 18.88	49 5 58.01	+ 29.34	+ 1 8.3	23 6 38.15	− 4 11	100 13 56.8	+22
	44	ψ² Aquarii . . .	9	11 55.11	− 1.38	− 18.88	48 42 0.24	+ 1 22.10	+ 1 7.4	23 11 34.85	− 4.11	99 50 50 9	+22
	45	97 Aquarii . . .	9	16 37.07	− 1.54	− 18.88	54 35 58.04	− 1 12.52	+ 1 23.1	23 16 16.65	− 4.23	105 42 29.8	+21
	46	α Andromedæ .	7	2 25.05	− 0.40	− **18.78**	10 24 . .	. .	. .	0 2 5.76	− 0.08	. . . .	.
	47	γ Pegasi . . .	7	7 17.87	− 0.79	− **18.91**	24 18 . .	. .	. .	0 6 58.18	+ 0.02	. . . .	.
	48	β Ceti	8	37 49.78	− 1.61	− **18.99**	57 28 . .	. .	. .	0 37 29.27	+ 0.15	. . . .	.
	49	32¹ Camelop., s. P. .	5	48 33.55	−15.08	− 18.91	302 55 57.20	+ 4 5.43	− 1 31.1	12 47 59.56	+ 6.55	354 4 52.7	+2
	50	32² Camelop., s. P. .	5	48 41.05	−15.08	− 18.91	302 55 57.20	+ 3 47.31	− 1 31.1	12 48 7.06	− 0.89	354 4 34.6	+

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	29.96	62.2	60.6
4	30.06	55.8	53.8
15	30.09	53.6	51.7
24	30.36	54.5	52.2
33	30.38	53.2	49.2
35	30.39	53.2	49.2
45	30.40	52.0	48.4

For summary of the elements of reduction see page 3.

12, 13, 29. One bisection.
4. Three bisections.
35, 37, 38, 43. Four bisections.

ZENITH-POINT CORR.

No. 1 to 2 + 58″.80
No. 3 to 17 + 58.42
No. 24 to 50 + 57.48

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′
1	− 6.5	− 8.0	+ 0.3	− 14
2	− 6.5	+ 8.0	. .	+ 1
38	− 15.0	. .	− 0.2	− 15

.TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
t. 6	1	ε Piscium . . .	9	56 57.58	− 0.97	− **18.90**	31 33 56.60	+ 4 59.07	+ 36.6	0 56 37.70	− 0.02	82 45 53.5	+ 0.7
.	2	Polaris . . .	5	13 50.78	+60.37	− 18.91	310 9 59.95	+ 5 18.19	− 1 10.0	1 14 32.24	− 0.35	1 20 29.3	+ 0.6
. 9	3	64 Aquarii . . .	.	. . .	. .	. .	49 30 0.11	+ 2 11.28	+ 1 8.2	. . . .	. .	100 39 40.8	+19.6
	4	70 Aquarii . . .	.	. . .	. .	. .	50 3 58.95	+ 25.39	+ 1 9.6	. . . .	. .	101 11 55.1	+20.2
	5	Mars, C. . .	.	. . .	. .	. .	50 41 57.91	+ 2 3.84	+ 1 11.2	. . . .	. .	101 51 34.2	. .
	6	Weisse 1241 .	.	. . .	. .	. .	49 5 57.14	+ 2 16.51	+ 1 7.5	. . . .	. .	100 15 42.4	+21.7
	7	Weisse 76 . .	.	. . .	. .	. .	49 5 57.14	+ 30.55	+ 1 7.3	. . . .	. .	100 13 56.2	+22.1
. 10	8	λ Ursæ Minoris .	2	45 12.65	+80.46	− 19.38	309 54 . .	. .	. .	19 46 13.73	− 0.33	. . . .	. .
	9	α² Capricorni . .	9	11 38.02	− 1.41	− **19.37**	51 43 56.90	+ 3 52.33	+ 1 12.0	20 11 17.23	+ 0.05	102 55 22.6	+ 1.2
	10	π Capricorni . .	9	20 41.42	− 1.56	− **19.39**	57 23 55.70	+ 4 58.23	+ 1 28.8	20 20 20.48	+ 0.05	108 36 43.9	+ 1.8
. 11	11	61¹ Cygni . . .	9	1 45.58	− 0.05	− **19.60**	0 40 0.28	+ 4 25.85	+ 0.8	21 1 25.89	− 0.05	51 50 48.1	− 1.0
	12	ζ Cygni . . .	9	8 4.83	− 0.33	− **19.58**	9 5 51.28	+ 3 49.92	+ 9.4	21 7 44.86	− 0.03	60 16 11.8	− 1.0
	13	ι Pegasi . .	9	16 47.28	− 0.61	− **19.67**	19 31 52.92	+ 4 17.97	+ 20.8	21 16 27.03	− 0.03	70 42 52.9	+ 1.0
	14	ι Draconis, S. P. .	9	20 1 90	−10.36	− 19.64	300 43 55.78	+ 2 58.94	− 1 37.5	9 19 31.90	+ 0.66	351 51 38.4	− 0.6
	15	β Aquarii . . .	5	25 29.50	− 1.19	− **19.66**	44 54 . .	. .	. .	21 25 8.67	+ 0.03	. . . .	. .
	16	ξ Aquarii . . .	9	31 36.89	− 1.22	− **19.72**	47 11 54.00	+ 4 43.18	+ 1 3.0	21 31 16.03	+ 0.14	98 24 1.4	0.0
	17	ε Pegasi . . .	9	38 32.59	− 0.85	− **19.63**	29 29 56.08	+ 4 5.31	+ 33.1	21 38 12.10	− 0.01	80 40 55.7	0.0
	18	11 Cephei . . .	9	40 25.42	+ 2.69	− 19.64	328 5 49.48	+ 3 13.87	− 36.2	21 40 8.47	− 0.15	19 14 48.4	− 1 7
	19	ο Cephei . . .	9	13 56.21	+ 2.10	− 19.64	331 23 50.62	+ 3 31.72	− 31.8	23 13 38.67	− 0.03	22 33 11.7	− 1.5
	20	θ Piscium . . .	9	22 8.24	− 0.91	− **19.69**	33 5 52.05	+ 4 30.83	+ 38.1	23 21 47.69	+ 0.10	84 17 22.2	+ 2.1
	21	ι Piscium . . .	9	34 2.00	− 0.94	− **19.63**	33 49 54.98	+ 5 2.22	+ 39.2	23 33 41.42	− 0.04	85 1 57.6	− 0.8
	22	ω Piscium . . .	9	53 24.33	− 0.91	− **19.68**	32 37 50.72	+ 3 45.59	+ 37.5	23 53 3.79	+ 0.05	83 48 35.0	− 0.9
	23	α Andromedæ .	9	2 25.78	− 0.36	− **19.54**	10 23 50.22	+ 4 26.92	+ 10.8	0 2 5.79	− 0.06	61 34 49.1	− 0.8
	24	4 Draconis, S. P. .	7	6 52.23	− 7.51	− 19.63	297 10 . .	. .	. .	12 6 25.09	+ 0.43	. . . .	. .
. 12	25	Moon S. . .	.	. . .	. .	. .	67 23 57.08	+ 5 6.21	+ 2 18.7	. . . .	. .	118 37 43.2	. .
	26	d Sagittarii . .	9	10 50.97	− 1.41	− **20 04**	57 57 55.58	+ 4 24.95	+ 1 32.7	19 10 29.51	+ 0.02	109 10 14.4	+ 4.8
	27	δ Aquilæ . . .	7	19 41.48	− 0.87	− **20.02**	35 55 58.08	+ 4 37.07	+ 42.2	19 19 20.56	+ 0.04	87 7 38.6	+ 2.6
	28	κ Aquilæ . . .	7	30 40.70	− 1.11	− **20.09**	46 5 59.10	+ 4 32.37	+ 1 0.5	19 30 19.55	+ 0.09	97 17 53.2	+ 2.3
	29	γ Aquilæ . . .	9	40 48.13	− 0.70	− **19.98**	28 29 58.98	+ 4 4.10	+ 31.7	19 40 27.39	− 0.03	79 40 56.0	+ 1.4
	30	λ Ursæ Minoris .	5	45 12.54	+78.30	− 20.03	309 53 55.50	+ 4 25.48	− 1 9.3	19 46 10.81	− 0.43	1 3 32 9	+ 2.2
	31	τ Aquilæ . . .	9	58 31.57	− 0.78	− **20.00**	31 52 0.42	+ 4 55.39	+ 36.3	19 58 10.76	0.00	83 3 53.3	+ 1.9
	32	α² Capricorni . .	9	11 38.56	− 1.26	− **20.10**	51 43 53.58	+ 3 53.87	+ 1 13.9	20 11 17.28	+ 0.14	102 55 22.5	+ 1.1
	33	O. Arg. S. 20407	9	13 22.60	− 1.33	− 20.02	54 11 58.18	+ 4 16.10	+ 1 20.8	20 13 1.25	− 3.52	105 23 56.3	+ 5.8
	34	Lalande 39210 .	9	18 49.59	− 1.32	− 20.01	54 1 53.12	+ 3 16.98	+ 1 20.3	20 18 28.26	− 3.55	105 12 51.6	+ 6.4
	35	O. Arg. S. 20541	9	22 33.44	− 1.34	− 20.01	54 17 52.85	+ 2 17.76	+ 1 21.1	20 22 12.09	− 3.57	105 27 52.9	+ 6.7
	36	Lalande 39579 .	9	27 45.86	− 1.31	− 20.01	52 55 59.45	+ 4 46.71	+ 1 17.3	20 27 24.54	− 3.56	104 8 24.7	+ 7.6
	37	ν Cygni . . .	9	52 57.47	+ 0.15	− **19.94**	358 7 52.28	+ 3 45.67	− 1.8	20 52 37.62	− 0.02	49 17 57.4	+ 2.8
	38	61¹ Cygni . . .	9	1 45.76	+ 0.11	− **19.96**	0 39 55.88	+ 4 32.85	+ 0.8	21 1 25.88	− 0.04	51 50 50.7	+ 1.8
	39	ζ Cygni . . .	9	8 5.01	− 0.19	− **19.92**	9 5 53.25	+ 3 50.47	+ 9.4	21 7 44.83	− 0.04	60 16 14.3	+ 1.6
	40	ι Pegasi . . .	9	16 47.44	− 0.51	− **19.95**	19 31 56.15	+ 4 16.94	+ 20.8	21 16 26.94	− 0.10	70 42 55.1	+ 3.2
	41	ξ Aquarii . . .	9	31 37.22	− 1.18	− **20.10**	47 11 58.70	+ 4 36.68	+ 1 3.2	21 31 16.06	+ 0.18	98 23 59.8	− 1.6
	42	α Aquarii . . .	9	59 52.71	− 1.02	− **20.04**	39 43 51.90	+ 3 39.32	+ 48.7	21 59 31.71	+ 0.08	90 54 41.1	+ 1.2
	43	50 Aquarii . . .	9	18 17.21	− 1.34	− 19.98	52 59 57.80	+ 1 12.71	+ 1 17.7	22 17 55.89	− 4.03	104 8 49.4	+17.4
	44	σ Aquarii . . .	9	24 33.59	− 1.27	− 19.98	50 10 0.98	+ 32.55	+ 1 10.2	22 24 12.34	− 3.99	101 18 5.0	+18.7
	45	64 Aquarii . . .	9	33 13.01	− 1.27	− 19.98	49 30 0.11	+ 2 11.79	+ 1 8.7	22 32 51.76	− 4.00	100 39 41.8	+19.5
	46	70 Aquarii . . .	9	42 27.22	− 1.28	− 19.98	50 3 59.12	+ 25.58	+ 1 10.3	22 42 5.96	− 4.04	101 11 56.2	+20.1
	47	Mars I, C. . .	4	47 43.53	− 1.29	− 19.98	50 24 0.52	+ 1 25.13	+ 1 11.3	22 47 22.26	+ 0.85	101 32 58.1	. .
	48	Mars II . . .	5	47 45.16	− 1.29	− 19.98	50 24 . .	. .	. .	22 47 23.89	− 0.78	. . . .	. .
	49	Weisse 1241 .	8	0 16.78	− 1.27	− 19.97	49 5 57.39	+ 2 15.93	+ 1 8.1	22 59 55.54	− 4.07	100 15 42.6	+21.5
	50	Weisse 76 . .	9	6 59.47	− 1.27	− 19.97	49 5 57.39	+ 29.99	+ 1 8.1	23 6 38.23	− 4.08	100 13 56.6	+22.0

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.40	50.5	47.5
30.15	52.8	52.4
30.15	52.3	51.4
30.00	63.9	62.8
30.05	52.5	51.0
30.05	52.0	49.5
30.15	57.0	56.0
30.16	55.2	52.5
30.18	54.0	51.2
30.17	52.0	49.0
30.19	51.2	47.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	"	' "	' "	° ' "
5	− 14.5	. .	− 0.2	− 14 7
25	−51 14.1	− 15 10.7	. .	− 1 6 24.8
47	− 14.0	− 0.3	. .	− 14.2

9, 36, 37, 39. One bisection.
5, 7, 25. Three bisections.
2, 3, 4, 6, 44, 45, 46, 47, 49, 50. Four bisections.
30. Five bisections.

ZENITH-POINT CORR.

No. 1 to 2	+ 57.48	
No. 3 to 7	+ 57.60	
No. 9 to 10	+ 56.88	
No. 11 to 23	+ 56.82	
No. 25 to 50	+ 58.24	

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Oct. 15	1	γ Pegasi	9	7 19.19	– 0.71	– **20.30**	24 17 52.02	+ 4 54.36	+ 26.0	0 6 58.16	– 0.01	75 29 33.6	+ 1.5
E.	2	B. A. C. 126 (R.)	.	. . .	. .	. .	203 15 51.80	+ 5 44.94	+ 24.8	. . . .	. .	27 44 19.7	+28.5
	3	B. A. C. 126.	.	. . .	. .	. .	336 33 56.18	+ 4 29.48	– 24.8	. . . .	. .	27 44 22.1	+28.5
	4	B. A. C. 166 (R.)	.	. . .	. .	. .	171 13 48.98	+ 4 25.72	– 8.8	. . . .	. .	59 48 15.3	+29.1
	5	B. A. C. 166.	.	. . .	. .	. .	8 37 51.18	+ 3 53.72	+ 8.8	. . . .	. .	59 48 14.9	+29.1
	6	β Ceti	9	37 51.11	– 1.50	– **20.40**	57 27 57.62	+ 3 29.22	+ 1 29.8	0 37 29.31	+ 0.16	108 39 17.8	+ 0.4
	7	32¹ Camelop., S. P.	5	48 35.97	–15.19	– 20.29	302 55 59.12	+ 3 56.51	– 1 28.0	12 48 0.49	+ 6.46	354 4 48.8	+23.6
	8	32² Camelop., S. P.	5	48 43.73	–15.19	– 20.29	302 55 59.12	+ 3 38.87	– 1 28.0	12 48 8.25	+ 0.20	354 4 31.2	+ 3.1
	9	Hera	9	0 13.93	– 1.10	– 20.29	40 39 58.05	+ 5 46.18	+ 49.4	0 59 52.54	. .	91 52 54.8	– 3.6
	10	Polaris	6	13 52.93	+60.99	– 20.28	310 9 54.80	+ 5 16.28	– 1 7.7	1 14 33.64	– 0.34	1 20 24.6	– 0.6
F. 16	11	ν Cygni	9	52 57.92	+ 0.22	– **20.55**	358 7 55.45	+ 3 41.90	– 1.8	20 52 37.57	+ 0.02	49 17 56.8	+ 2.6
	12	α Cephei	9	15 59.13	+ 1.72	– 20.57	336 45 57.92	+ 3 43.67	– 24.1	21 15 40.28	+ 0.05	27 55 38.7	– 1.7
	13	ι Pegasi	2	16 47.94	– 0.51	– **20.51**	19 32 1.05	+ 4 11.56	+ 20.1	21 16 26.86	– 0.12	70 42 53.9	+ 2.2
	14	B. A. C. 7504	5	23 41.55	+23.44	– 20.57	312 17 59.00	+ 4 47.19	– 1 1.7	21 23 44.42	+ 8.29	3 28 5.7	+27.2
	15	μ Capricorni	7	47 1.14	– 1.33	– **20.59**	52 56 . .	. .	. .	21 46 39.24	+ 0.02	. . . .	. .
	16	Moon I, S.	7	50 25.01	– 1.34	– 20.57	53 15 58.92	+ 4 47.32	+ 1 15.9	21 50 3.10	+62.75	104 28 23.3	. .
	17	α Aquarii	9	59 53.26	– 1.02	– **20.63**	39 43 58.48	+ 3 34.04	+ 47.2	21 59 31.67	+ 0.08	90 54 40.9	+ 1.0
	18	50 Aquarii	9	18 17.66	– 1.33	– 20.57	53 0 5.48	+ 1 7.60	+ 1 15.3	22 17 55.76	– 3.99	104 8 49.6	+17.2
	19	σ Aquarii	9	24 34.07	– 1.27	– 20.57	50 10 3.71	+ 32.60	+ 1 8.1	22 24 12.23	– 3.95	101 18 5.6	+18.5
S. 17	20	50 Aquarii	.	. . .	. .	. .	52 59 57.86	+ 1 14.39	+ 1 16.5	. . . .	. .	104 8 49.9	+17.1
	21	σ Aquarii	.	. . .	. .	. .	50 10 1.45	+ 33.34	+ 1 9.1	. . . .	. .	101 18 5.1	+18.4
	22	64 Aquarii	.	. . .	. .	. .	49 29 54.95	+ 2 19.09	+ 1 7.6	. . . .	. .	100 39 42.8	+19.3
	23	70 Aquarii	.	. . .	. .	. .	50 4 0.90	+ 25.11	+ 1 8.9	. . . .	. .	101 11 56.2	+19.8
	24	Mars, C.	.	. . .	. .	. .	49 47 58.55	+ 1 25.74	+ 1 8.4	. . . .	. .	100 56 53.8	. .
	25	Weisse 1241	.	. . .	. .	. .	49 5 59.39	+ 2 15.62	+ 1 6.8	. . . .	. .	100 15 43.0	+21.3
	26	Weisse 76	.	. . .	. .	. .	49 5 58.32	+ 30.41	+ 1 6.8	. . . .	. .	100 13 56.7	+21.7
	27	ψ² Aquarii	.	. . .	. .	. .	48 42 4.08	+ 1 9.50	+ 1 5.9	. . . .	. .	99 50 50.6	+22.1
	28	97 Aquarii	.	. . .	. .	. .	54 33 57.79	+ 48.94	+ 1 21.3	. . . .	. .	105 42 29.2	+21.1
P. 18	29	μ Capricorni	9	47 0.91	– 1.27	– **20.44**	52 55 50.35	+ 4 7.81	+ 1 15.3	21 46 39.21	+ 0.01	104 7 34.7	+ 3.6
	30	α Aquarii	9	59 53.00	– 0.97	– **20.44**	39 43 57.00	+ 3 35.94	+ 47.4	21 59 31.60	+ 0.03	90 54 41.5	+ 1.6
	31	Weisse (2) 175	9	8 50.26	– 0.54	– 20.43	21 23 54.05	+ 4 19.22	+ 22.2	22 8 29.29	– 3.34	72 34 56.7	+24.8
	32	Durch. 22°, 4614	9	13 40.58	– 0.40	– 20.43	15 55 53.52	+ 3 24.54	+ 16.3	22 13 19.75	– 3.28	67 5 55.6	+26.2
	33	50 Aquarii	9	18 17.39	– 1.27	– 20.43	52 59 53.48	+ 1 21.41	+ 1 15.4	22 17 55.69	– 3.97	104 8 51.5	+17.1
	34	σ Aquarii	9	24 33.86	– 1.23	– 20.43	50 9 56.14	+ 40.67	+ 1 8.2	22 24 12.20	– 3.93	101 18 6.2	+18.4
	35	64 Aquarii	9	33 13.29	– 1.19	– 20.43	49 29 56.70	+ 2 18.82	+ 1 6.7	22 32 51.67	– 3.95	100 39 43.4	+19.2
	36	ζ Pegasi	9	35 44.41	– 0.72	– **20.41**	28 37 57.12	+ 3 24.19	+ 31.2	22 35 23.26	+ 0.07	79 48 13.7	+ 2.7
	37	70 Aquarii	9	42 27.49	– 1.21	– 20.43	50 3 56.99	+ 31.02	+ 1 8.0	22 42 5.85	+ 3.90	101 11 57.2	+19.7
	38	Mars I, C.	4	50 6.76	– 1.20	– 20.43	49 39 57.54	+ 1 33.35	+ 1 7.1	22 49 45.13	+ 0.71	100 48 59.2	. .
	39	Mars II	5	50 8.10	– 1.20	– 20.43	49 40 . .	. .	. .	22 49 46.47	– 0.63	. . . .	. .
	40	Weisse 1241	9	0 17.10	– 1.19	– 20.43	49 5 58.06	+ 2 19.08	+ 1 5.8	22 59 55.48	– 4.03	100 15 44.2	+21.2
	41	Weisse 76	9	6 59.63	– 1.19	– 20.43	49 5 58.06	+ 33.46	+ 1 5.8	23 6 38.01	– 4.05	100 13 58.5	+21.7
	42	ψ² Aquarii	9	11 56.32	– 1.18	– 20.43	48 41 56.48	+ 1 29.29	+ 1 4.9	23 11 34.71	– 4.06	99 50 51.9	+22.1
	43	97 Aquarii	9	16 38.24	– 1.32	– 20.43	54 33 56.35	+ 52.54	+ 1 20.0	23 16 16.49	– 4.17	105 42 30.1	+21.0
	44	Moon, S.	.	. . .	. .	. .	42 11 55.45	+ 2 56.75	+ 51.8	. . . .	. .	93 22 5.2	. .
	45	ι Piscium	9	34 2.70	– 0.85	– **20.45**	33 49 54.38	+ 5 5.63	+ 38.4	23 33 41.42	– 0.01	85 1 59.6	+ 1.3
	46	B. A. C. 262	5	52 34.03	+17.02	– 20.42	313 13 53.17	+ 4 35.87	– 1 0.4	0 52 30.63	–15.84	4 23 49.8	+25.9
	47	Hera	9	57 54.49	– 1.01	– 20.42	40 55 52.90	+ 5 2.78	+ 49.7	0 57 33.06	. .	92 8 6.6	– 3.6
	48	Idunna	6	3 59.91	– 0.80	– 20.42	31 31 52.15	+ 7 52.29	+ 35.2	1 3 38.69	. .	82 46 40.8	. .
	49	Anonymous	6	4 6.22	– 0.79	– 20.42	31 31 52.15	+ 7 6.12	+ 35.2	1 3 45.01	– 4.16	82 45 54.7	+28.4
	50	Polaris	5	13 55.28	+59.33	– 20.42	310 9 55.05	+ 5 16.40	– 1 7.4	1 14 34.19	+ 0.44	1 20 25.2	+ 1.1

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
10	30.22	63.0	61.5
11	30.08	70.5	70.2
19	30.10	65.2	63.6
20	30.12	58.9	57.0
28	30.12	57.2	55.0
29	30.03	64.2	63.0
38	30.04	63.4	61.4
50	30.02	61.6	60.3

For summary of the elements of reduction see page 3.

12, 49. One bisection.

16, 20, 21, 23, 24, 25, 26, 27, 28, 44, 46. Three bisections.

19, 33, 34, 35, 37, 38, 40, 41, 42, 43. Four bisections.

50. Five bisections.

ZENITH-POINT CORR.

	″
No. 1 to 10	+ 60.72
No. 11 to 19	+ 60.07
No. 20 to 28	+ 61.01
No. 29 to 50	+ 61.54

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
16	–43 17.8	– 14 47.2	. .	– 58 5.0
24	– 13.1	. .	– 0.3	– 13.4
38	– 13.0	. .	– 0.3	– 13.3
44	–36 25.2	– 14 51.6	. .	– 51 16.8

TE ID 'R.	Number.	OBJECT.	Thread.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
. 14	1	B. A. C. 7643 (R.) .	.	. . .	. .	. .	197 3 54.00	+ 4 24.32	+ 17.8	. . . .	. .	33 57 45.1	+28.8
'.	2	B. A. C. 7643 . .	.	. . .	. .	. .	342 47 55.70	+ 3 46.96	− 17.8	. . . .	. .	33 57 46.1	+28.8
	3	θ Aquarii (R.) . .	.	. . .	. .	. .	132 39 54.65	+ 4 5.01	− 1 2.3	. . . .	. .	98 23 23.8	+ 0.6
	4	θ Aquarii . . .	.	. . .	. .	. .	47 11 53.80	+ 4 6.19	+ 1 2.3	. . . .	. .	98 23 23.5	+ 0.3
	5	50 Aquarii . . .	9	18 17.72	− 1.32	− 20.62	52 59 55.46	+ 1 16.99	+ 1 16.4	22 17 55.78	− 4.01	104 8 50.1	+17.3
	6	σ Aquarii . . .	9	24 34.16	− 1.26	− 20.62	50 9 54.84	+ 40.16	+ 1 9.1	22 24 12.28	− 3.97	101 18 5.3	+18.6
	7	64 Aquarii . . .	9	33 13.59	− 1.23	− 20.63	49 29 54.95	+ 2 18.90	+ 1 7.6	22 32 51.73	− 3.98	100 39 42.6	+19.4
	8	70 Aquarii . . .	7	42 27.75	− 1.25	− 20.63	50 3 54.92	+ 31.85	+ 1 8.9	22 42 5.87	− 4.02	101 11 56.9	+20.0
	9	Mars I, C. . .	4	48 20.58	− 1.25	− 20.64	50 9 56.24	+ 49.47	+ 1 9.2	22 47 58.69	+ 0.74	101 19 16.2	. .
	10	Mars II . . .	5	48 21.98	− 1.25	− 20.64	50 10 . .	. .	. .	22 48 0.09	− 0.66	. . . .	. .
	11	Weisse 1241 .	9	0 17.33	− 1.22	− 20.64	49 5 54.70	+ 2 20.90	+ 1 6.8	22 59 55.47	− 4.06	100 15 43.6	+21.4
	12	Weisse 76 . .	9	6 59.98	− 1.22	− 20.65	49 5 54.70	+ 34.42	+ 1 6.7	23 6 38.11	− 4.07	100 13 57.1	+21.9
	13	ψ³ Aquarii . . .	9	11 56.57	− 1.21	− 20.65	48 41 54.66	+ 1 28.99	+ 1 5.9	23 11 34.71	− 4.08	99 50 50.7	+22.3
	14	97 Aquarii . . .	9	16 38.51	− 1.35	− 20.65	54 33 53.39	+ 52.85	+ 1 21.3	23 16 16.51	− 4.20	105 42 28.7	+21.3
	15	θ Piscium . . .	9	22 9.14	− 0.84	− **20.67**	33 5 56.85	+ 4 25.50	+ 37.9	23 21 47.65	+ 0.07	84 17 21.5	+ 1.5
	16	γ Cephei (R.) . .	.	. . .	. .	. .	217 57 51.12	+ 5 0.63	+ 45.3	. . . .	. .	13 2 44.1	− 1.7
	17	γ Cephei . . .	5	34 39.02	+ 5.26	− 20.66	321 53 54.88	+ 3 16.16	− 45.3	23 34 23.62	+ 0.23	13 2 46.9	+ 1.1
	18	Anonymous .	9	43 44.18	− 1.29	− 20.67	51 49 53.98	+ 3 52.44	+ 1 13.8	23 43 22.22	− 4.20	103 1 21.4	+23.6
	19	O. Arg. N. 26144	5	48 2.15	+ 3.16	− 20.67	327 59 54.40	+ 5 29 15	− 36.1	23 47 44.64	− 4.57	19 11 8.7	+29.0
	20	ω Piscium . . .	9	53 25.23	− 0.83	− **20.66**	32 37 53.98	+ 3 43.67	+ 37.2	23 53 3.73	− 0.01	83 48 36.0	+ 0.1
	21	α Andromedæ (R.)	.	. . .	. .	. .	169 27 50.85	+ 3 50.46	− 10.7	. . . .	. .	61 34 50.6	+ 1.1
	22	α Andromedæ .	.	. . .	. .	. .	10 23 52.65	+ 4 25.35	+ 10.7	. . . .	. .	61 34 49.9	+ 0.4
	23	γ Pegasi . . .	9	7 19.46	− 0.62	− **20.66**	24 17 52.20	+ 4 53.57	+ 26.3	0 6 58.16	− 0.01	75 29 33.3	+ 1.1
	24	12 Ceti	9	24 11.57	− 1.09	− 20.69	43 25 58.15	+ 4 32.27	+ 55.0	0 23 49.79	− 4.14	94 37 46.6	+26.7
	25	B. A. C. 152. .	9	30 30.08	+ 0.38	− 20.69	355 1 54.85	+ 2 44.80	− 5.0	0 30 9.77	− 4.22	46 10 55.8	+28.9
	26	β Ceti	9	37 51.28	− 1.42	− **20.65**	57 28 1.00	+ 3 23.80	+ 1 30.9	0 37 29.16	+ 0.01	108 39 16.9	− 0.4
	27	Weisse (2) 1062 .	9	42 54.70	+ 0 23	− 20.70	358 25 50.98	+ 2 39.56	− 1.5	0 42 34.23	− 4.26	49 34 50.2	+28.6
	28	B. A. C. 227 .	7	43 26.72	+ 0.23	− 20.70	358 25 50.98	+ 2 40.11	− 1.5	0 43 6.25	− 4.26	49 34 59.8	+28.6
	29	ε Piscium . . .	9	56 59.31	− 0.79	− **20.77**	31 33 55.08	+ 5 0.34	+ 35.8	0 56 37.81	+ 0.05	82 45 52.4	+ 0.1
	30	Polaris . . .	5	13 52.44	+62.08	− 20.72	310 9 53.98	+ 5 20.06	− 1 8.5	1 14 33.80	− 0.21	1 20 26.7	+ 1.1
. 15	31	Moon I, S. . .	9	3 48.84	− 1.52	− 20.43	58 8 2.88	+ 4 8.99	+ 1 31.7	21 3 26.89	+64.48	109 20 4.8	. .
	32	ζ Cygni . . .	6	8 5.49	− 0.28	− **20.36**	9 5 56.45	+ 3 46.47	+ 9.2	21 7 44.78	− 0.04	60 16 13.3	+ 0.8
	33	ι Pegasi . . .	9	16 47.86	− 0.60	− **20.33**	19 31 58.28	+ 4 14.32	+ 20.3	21 16 26.84	− 0.15	70 42 54.1	+ 2.3
	34	β Aquarii . . .	9	25 30.27	− 1.21	− **20.47**	44 54 1.52	+ 5 6.18	+ 57.0	21 25 8.64	+ 0.06	96 6 25.9	+ 1.8
	35	ξ Aquarii . . .	9	31 37.63	− 1.26	− **20.47**	47 11 54.25	+ 4 46.36	+ 1 1.7	21 31 15.95	+ 0.11	98 24 3.5	+ 2.0
	36	ε Pegasi . . .	9	38 33.28	− 0.85	− **20.36**	29 29 57.08	+ 4 7.08	+ 32.4	21 38 12.02	− 0.05	80 40 57.8	+ 2.3
	37	μ Capricorni . .	9	47 1.16	− 1.40	− **20.53**	52 55 55.88	+ 4 0.39	+ 1 15.6	21 46 39.35	+ 0.12	104 7 33.1	+ 2.1
	38	50 Aquarii . . .	9	18 17.59	− 1.39	− 20.39	52 59 54.78	+ 1 19.72	+ 1 15.7	22 17 55.81	− 4.00	104 8 51.4	+17.2
	39	σ Aquarii . . .	9	24 33.96	− 1.32	− 20.39	50 9 56.92	+ 39.40	+ 1 8.5	22 24 12.25	− 3.96	101 18 6.0	+18.5
	40	64 Aquarii . . .	9	33 13.40	− 1.31	− 20.38	49 30 0.78	+ 2 12.85	+ 1 6.9	22 32 51.71	− 3.98	100 39 41.7	+19.4
	41	70 Aquarii . . .	9	42 27.54	− 1.32	− 20.37	50 3 53.10	+ 34.75	+ 1 8.2	22 42 5.85	− 4.02	101 11 57.2	+19.9
	42	Mars I, C. . .	4	48 42.88	− 1.32	− 20.36	50 1 54.88	+ 2 39.14	+ 1 8.1	22 48 21.20	+ 0.76	101 12 3.3	. .
	43	Mars II . . .	5	48 44.32	− 1.32	− 20.36	50 2 . .	. .	. .	22 48 22.64	− 0.68	. . . .	. .
	44	Weisse 1241 .	9	0 17.09	− 1.30	− 20.36	49 5 54.80	+ 2 21.80	+ 1 6.0	22 59 55.43	− 4.05	100 15 43.8	+21.4
	45	Weisse 76 . .	8	6 59.76	− 1.30	− 20.35	49 5 54.25	+ 35.83	+ 1 6.0	23 6 38.11	− 4.07	100 13 57.2	+21.8
	46	ψ³ Aquarii . . .	9	11 56.43	− 1.29	− 20.35	48 41 51.32	+ 1 34.24	+ 1 5.1	23 11 34.79	− 4.07	99 50 51.8	+22.2
	47	97 Aquarii . . .	9	16 38.32	− 1.43	− 20.35	54 33 54.10	+ 53.64	+ 1 20.3	23 16 16.54	− 4.19	105 42 29.2	+21.3
	48	Vesta . . .	9	28 26.96	− 1.41	− 20.34	54 3 51.68	+ 7 5.34	+ 1 19.1	23 28 5.21	. .	105 18 37.3	− 4.6
	49	ω Piscium . . .	9	53 25.01	− 0.91	− **20.36**	32 37 56.02	+ 3 42.18	+ 36.7	23 53 3.77	+ 0.03	83 48 36.1	+ 0.3
	50	α Andromedæ .	9	2 26.41	− 0.32	− **20.21**	10 23 53.65	+ 4 25.58	+ 10.6	0 2 5.77	− 0.08	61 34 51.0	+ 1.7

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.30	61.2	60.0
30.30	59.0	57.8
30.30	57.4	56.7
30.26	66.5	65.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	″	° ′ ″
9	− 13.6	. .	− 0.3	− 13.9
31	−45 58.2	− 14 48.8	. .	− 1 0 47.0
42	− 13.5	. .	− 0.3	− 13.7

ZENITH-POINT CORR.

No. 1 to 30	+ 61″.44
No. 31 to 50	+ 60.72

31. Three bisections.
30. Five bisections.
5, 6, 7, 11, 12, 13, 14, 38, 39, 40, 41, 44, 46. } Four bisections.

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Oct. 15	1	γ Pegasi . . .	9	7 19.19	− 0.71	− **20.30**	24 17 52.02	+ 4 54.36	+ 26.0	0 6 58.16	− 0.01	75 29 33.6	+
E.	2	B. A. C. 126 (R.) .	.	. .	. .	. .	203 15 51.80	+ 5 44.94	+ 24.8	. . . .	. .	27 44 19.7	+2
	3	B. A. C. 126. .	.	. .	. .	. .	336 33 56.18	+ 4 29.48	− 24.8	. . . .	. .	27 44 22.1	+2
	4	B. A. C. 166 (R.).	.	. .	. .	. .	171 13 48.98	+ 4 25.72	− 8.8	. . . .	. .	59 48 15.3	+2
	5	B. A. C. 166. .	.	. .	. .	. .	8 37 51.18	+ 3 53.72	+ 8.8	. . . .	. .	59 48 14.9	+2
	6	β Ceti	9	37 51.11	− 1.50	− **20.40**	57 27 57.62	+ 3 29.22	+ 1 29.8	0 37 29.31	+ 0.16	108 39 17.8	+
	7	32¹ Camelop., S. P. .	5	48 35.97	−15.19	− 20.29	302 55 59.12	+ 3 56.51	− 1 28.0	12 48 0.49	+ 6.46	354 4 48.8	+2
	8	32² Camelop., S. P. .	5	48 43.73	−15.19	− 20.29	302 55 59.12	+ 3 38.87	− 1 28.0	12 48 8.25	+ 0.20	354 4 31.2	+
	9	Hera	9	0 13.93	− 1.10	− 20.29	40 39 58.05	+ 5 46.18	+ 49.4	0 59 52.54	. .	91 52 54.8	−
	10	Polaris . . .	6	13 52.93	+60.99	− 20.28	310 9 54.80	+ 5 16.28	− 1 7.7	1 14 33.64	− 0.34	1 20 24.6	−
F. 16	11	ν Cygni . . .	9	52 57.92	+ 0.22	− **20.55**	358 7 55.45	+ 3 41.90	− 1.8	20 52 37.57	+ 0.02	49 17 56.8	+
	12	α Cephei . . .	9	15 59.13	+ 1.72	− 20.57	330 45 57.92	+ 3 43.67	− 24.1	21 15 40.28	+ 0.05	27 55 38.7	−
	13	ι Pegasi . . .	2	16 47.94	− 0.51	− **20.51**	19 32 1.05	+ 4 11.56	+ 20.1	21 16 26.86	− 0.12	70 42 53.9	+
	14	B. A. C. 7504 .	5	23 41.55	+23.44	− 20.57	312 17 59.00	+ 4 47.19	− 1 1.7	21 23 44.42	+ 8.29	3 28 5.7	+2
	15	μ Capricorni . .	7	47 1.14	− 1.33	− **20.59**	52 56 . .	. .	. .	21 46 39.24	+ 0.02	. . . .	
	16	Moon I, S. . .	7	50 25.01	− 1.34	− 20.57	53 15 58.92	+ 4 47.32	+ 1 15.9	21 50 3.10	+62.75	104 28 23.3	
	17	α Aquarii . . .	9	59 53.26	− 1.02	− **20.63**	39 43 58.48	+ 3 34.04	+ 47.2	21 59 31.67	+ 0.08	90 54 40.9	+ 1
	18	50 Aquarii . . .	9	18 17.66	− 1.33	− 20.57	53 0 5.48	+ 1 7.60	+ 1 15.3	22 17 55.76	− 3.99	104 8 49.6	+1
	19	σ Aquarii . . .	9	24 34.07	− 1.27	− 20.57	50 10 3.71	+ 32.60	+ 1 8.1	22 24 12.23	− 3.95	101 18 5.6	+1
S. 17	20	50 Aquarii . . .	.	. .	. .	. .	52 59 57.86	+ 1 14.39	+ 1 16.5	. . . .	. .	104 8 49.9	+1
	21	σ Aquarii . . .	.	. .	. .	. .	50 10 1.45	+ 33.34	+ 1 9.1	. . . .	. .	101 18 5.1	+1
	22	64 Aquarii . . .	.	. .	. .	. .	49 29 54.95	+ 2 19.09	+ 1 7.6	. . . .	. .	100 39 42.8	+1
	23	70 Aquarii . . .	.	. .	. .	. .	50 4 0.90	+ 25.11	+ 1 8.9	. . . .	. .	101 11 56.2	+1
	24	Mars, C. . .	.	. .	. .	. .	49 47 58.55	+ 1 25.74	+ 1 8.4	. . . .	. .	100 56 53.8	.
	25	Weisse 1241 . .	.	. .	. .	. .	49 5 59.39	+ 2 15.62	+ 1 6.8	. . . .	. .	100 15 43.0	+21
	26	Weisse 76 . . .	.	. .	. .	. .	49 5 58.32	+ 30.41	+ 1 6.8	. . . .	. .	100 13 56.7	+21
	27	ψ² Aquarii . . .	.	. .	. .	. .	48 42 4.08	+ 1 9.50	+ 1 5.9	. . . .	. .	99 50 50.6	+22
	28	97 Aquarii . . .	.	. .	. .	. .	54 33 57.79	+ 48.94	+ 1 21.3	. . . .	. .	105 42 29.2	+21
P. 18	29	μ Capricorni . .	9	47 0.91	− 1.27	− **20.44**	52 55 50 35	+ 4 7.81	+ 1 15.3	21 46 39.21	+ 0.01	104 7 34.7	+ 3
	30	α Aquarii . . .	9	59 53.00	− 0.97	− **20.44**	39 43 57.00	+ 3 35.94	+ 47.4	21 59 31.60	+ 0.03	90 54 41.5	+ 1
	31	Weisse (2) 175 .	9	8 50.26	− 0.54	− 20.43	21 23 54.05	+ 4 19.22	+ 22.2	22 8 29.29	− 3.34	72 34 56.7	+24
	32	Durch. 22°, 4614	9	13 40.58	− 0.40	− 20.43	15 55 53.52	+ 3 24.54	+ 16.3	22 13 19.75	− 3.28	67 5 55.6	+26
	33	50 Aquarii . . .	9	18 17.39	− 1.27	− 20.43	52 59 53.48	+ 1 21.41	+ 1 15.4	22 17 55.69	− 3.97	104 8 51.5	+17
	34	σ Aquarii . . .	9	24 33.86	− 1.23	− 20.43	50 9 56.14	+ 40.67	+ 1 8.2	22 24 12.20	− 3.93	101 18 6.2	+18
	35	64 Aquarii . . .	9	33 13.29	− 1.19	− 20.43	49 29 56.70	+ 2 18.82	+ 1 6.7	22 32 51.67	− 3.95	100 39 43.4	+19
	36	ζ Pegasi . . .	9	35 44.41	− 0.72	− **20.41**	28 37 57.12	+ 3 24.19	+ 31.2	22 35 23.26	+ 0.07	79 48 13.7	+ 2
	37	70 Aquarii . . .	9	42 27.49	− 1.21	− 20.43	50 3 56.99	+ 31.02	+ 1 8.0	22 42 5.85	+ 3.90	101 11 57.2	+19
	38	Mars I, C. . .	4	50 6.76	− 1.20	− 20.43	49 39 57.54	+ 1 33.35	+ 1 7.1	22 49 45.13	+ 0.71	100 48 59.2	.
	39	Mars II . . .	5	50 8.10	− 1.20	− 20.43	49 40 . .	. .	. .	22 49 46.47	− 0.63	. . . .	.
	40	Weisse 1241 .	9	0 17.10	− 1.19	− 20.43	49 5 58.06	+ 2 19.08	+ 1 5.8	22 59 55.48	− 4.03	100 15 44.2	+21.
	41	Weisse 76 . .	9	6 59.63	− 1.19	− 20.43	49 5 58.06	+ 33.46	+ 1 5.8	23 6 38.01	− 4.05	100 13 58.5	+21.
	42	ψ² Aquarii . . .	9	11 56.32	− 1.18	− 20.43	48 41 56.48	+ 1 29.29	+ 1 4.9	23 11 34.71	− 4.06	99 50 51.9	+22.
	43	97 Aquarii . . .	9	16 38.24	− 1.32	− 20.43	54 33 56.35	+ 52.54	+ 1 20.0	23 16 16.49	− 4.17	105 42 30.1	+21.
	44	Moon, S. . .	.	. .	. .	. .	42 11 55.45	+ 2 56.75	+ 51.8	. . . .	. .	93 22 5.2	.
	45	ι Piscium . . .	9	34 2.70	− 0.85	− **20.45**	33 49 54.38	+ 5 5.63	+ 38.4	23 33 41.42	− 0.01	85 1 59.6	+ 1.
	46	B. A. C. 262 .	5	52 34.03	+17.02	− 20.42	313 13 53.17	+ 4 35.87	− 1 0.4	0 52 30.63	−15.84	4 23 49.8	+25.
	47	Hera	9	57 54.49	− 1.01	− 20.42	40 55 52.90	+ 5 2.78	+ 49.7	0 57 33.06	. .	92 8 6.6	− 3.
	48	Idunna . . .	6	3 59.91	− 0.80	− 20.42	31 31 52.15	+ 7 52.29	+ 35.2	1 3 38.69	. .	82 46 40.8	.
	49	Anonymous .	6	4 6.22	− 0.79	− 20.42	31 31 52.15	+ 7 6.12	+ 35.2	1 3 45.01	− 4.16	82 45 54.7	+28.
	50	Polaris . . .	5	13 55.28	+59 33	− 20.42	310 9 55.05	+ 5 16.40	− 1 7.4	1 14 34.19	+ 0.44	1 20 25.2	+ 1.

No.	Barom.	At. Ther.	Ex. Ther.
	in.		
10	30.22	63.0	61.5
11	30.08	70.5	70.2
19	30.10	65.2	63.6
20	30.12	58.9	57.0
28	30.12	57.2	55.0
29	30.03	64.2	63.0
38	30.04	63.4	61.4
50	30.02	61.6	60.3

For summary of the elements of reduction see page 3.

12, 49. One bisection.

16, 20, 21, 23, 24, 25, 26, 27, 28, 44, 46. Three bisections.

19, 33, 34, 35, 37, 38, 40, 41, 42, 43. Four bisections.

50. Five bisections.

ZENITH-POINT CORR.

	″
No. 1 to 10	+ 60.72
No. 11 to 19	+ 60.07
No. 20 to 28	+ 61.01
No. 29 to 50	+ 61.54

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
16	−43 17.8	− 14 47.2	. .	− 58 5
24	− 13.1	. .	− 0.3	− 13.
38	− 13.0	. .	− 0.3	− 13
44	−36 25.2	− 14 51.6	. .	− 51 16.

	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
8	1	θ¹ Ceti	9	18 18.34	− 1.16	**− 20.44**	47 37 54.95	+ 3 21.39	+ 1 2.7	1 17 56.76	+ 0.02	98 48 40.2	+ 2.0
	2	η Piscium	9	25 19.49	− 0.62	**− 20.45**	24 5 54.42	+ 4 12.08	+ 25.6	1 24 58.45	+ 0.11	75 16 53.3	+ 2.9
	3	θ Piscium	9	39 19.40	− 0.77	**− 20.42**	30 15 53.42	+ 4 28.14	+ 33.4	1 38 58.21	− 0.05	81 27 16.2	+ 1.3
	4	β Arietis	9	48 16.01	− 0.48	**− 20.35**	18 35 52.98	+ 4 39.11	+ 19.3	1 47 55.11	− 0.05	69 47 12.6	+ 2.8
	5	Brad. 329 (Mira)	4	13 33.71	− 1.04	− 20.42	42 17 53.75	+ 6 38.69	+ 52.1	2 13 12.25	− 4.18	93 31 45.7	+27.8
	6	Piazzi II, 57.	4	13 41.46	− 1.04	− 20.42	42 17 53.75	+ 6 22.63	+ 52.1	2 13 20.00	− 4.18	93 31 29.7	+27.8
	7	Neptune	9	19 14.47	− 0.69	− 20.42	26 51 55.20	+ 4 53.81	+ 29.0	2 18 53.36	. .	78 3 39.2	. .
	8	ξ² Ceti	9	22 2.73	− 0.78	− 20.42	30 53 57.22	+ 4 12.87	+ 34.3	2 21 41.53	− 4.24	82 5 5.6	+27.2
	9	Lalande 4803	9	29 45.86	− 0.82	− 20.42	32 29 53.12	+ 4 45.63	+ 36.5	2 29 24.62	− 4.23	83 41 36.5	+27.1
	10	γ Ceti (R.)	. .	. . .	. .	. .	143 45 53.45	+ 4 35.70	− 41.7	. . . .	. .	87 16 33.7	+ 0.2
	11	γ Ceti	2	37 21.19	− 0.90	− 20.42	36 5 57.35	+ 3 32.74	+ 41.7	2 36 59.87	− 0.02	87 16 33.0	− 0.5
	12	B. A. C. 893.	9	46 29.07	− 2.01	− 20.42	79 9 55.50	+ 4 48.65	+ 4 51.6	2 46 0.64	− 4.18	130 25 57.0	+28.2
	13	B. A. C. 962 (R.)	. .	. . .	. .	. .	190 9 46.40	+ 5 14.78	+ 10.3	. . . .	. .	40 51 9.7	+19.8
	14	B. A. C. 962	. .	. . .	. .	. .	349 39 51.52	+ 5 8.72	− 10.3	. . . .	. .	40 51 11.1	+19.8
2	15	61¹ Cygni	9	1 45.94	+ 0.04	**− 20.27**	0 39 54.65	+ 4 32.76	+ 0.8	21 1 25.63	− 0.09	51 50 49.4	+ 1.6
	16	ι Pegasi	9	16 47.81	− 0.60	**− 20.39**	19 31 54.60	+ 4 18.09	+ 20.7	21 16 26.86	− 0.02	70 42 54.6	+ 3.1
	17	β Aquarii	9	25 30.11	− 1.26	**− 20.35**	44 53 56.35	+ 5 10.02	+ 58.2	21 25 8.49	0.00	96 6 25.8	+ 1.5
	18	ξ Aquarii	9	31 37.47	− 1.31	**− 20.35**	47 11 52.00	+ 4 45.54	+ 1 3.0	21 31 15.80	+ 0.05	98 24 1.7	0.0
	19	ε Pegasi	9	38 33.17	− 0.87	**− 20.32**	29 29 57.12	+ 4 5.37	+ 33.1	21 38 11.94	− 0.04	80 40 56.8	+ 1.4
	20	α Aquarii	9	59 53.04	− 1.13	**− 20.37**	39 43 59.32	+ 3 31.80	+ 48.6	21 59 31.55	+ 0.03	90 54 40.9	+ 1.0
	21	B. A. C. 7743	7	6 19.99	+ 0.21	− 20.36	356 25 57.42	+ 1 44.08	− 3.6	22 5 59.84	− 2.82	47 33 59.1	+29.6
	22	B. A. C. 7770	9	9 57.56	+ 0.21	− 20.36	356 25 57.42	+ 6 36.18	− 3.5	22 9 37.41	− 2.86	47 38 51.3	+29.7
	23	θ Aquarii	2	10 46.08	− 1.31	**− 20.44**	47 11 56.90	+ 4 1.73	+ 1 3.1	22 10 24.41	+ 0.10	98 23 22.9	− 0.6
	24	α Andromedæ	9	2 26.51	− 0.34	**− 20.31**	10 23 54.30	+ 4 22.58	+ 10.8	0 2 5.81	− 0.02	61 34 48.9	+ 0.6
	25	γ Pegasi	9	7 19.24	− 0.75	**− 20.31**	24 17 59.15	+ 4 45.37	+ 26.6	0 6 58.13	− 0.04	75 29 32.3	+ 0.7
	26	β Ceti	9	37 51.19	− 1.58	**− 20.39**	57 27 56.18	+ 3 28.21	+ 1 32.2	0 37 29.24	+ 0.08	108 39 17.8	− 0.4
	27	ε Piscium	9	56 59.10	− 0.93	**− 20.39**	31 33 58.65	+ 4 56.57	+ 36.3	0 56 37.80	+ 0.01	82 45 52.7	+ 0.6
	28	Polaris	5	13 52.38	+61.44	− 20.37	310 9 58.20	+ 5 12.93	− 1 9.6	1 14 33.45	− 0.34	1 20 22.7	+ 0.1
	29	θ¹ Ceti	9	18 18.42	− 1.33	**− 20.33**	47 37 52.60	+ 3 20.52	+ 1 4.7	1 17 56.72	− 0.04	98 48 39.0	+ 0.6
	30	η Piscium	9	25 19.63	− 0.74	**− 20.45**	24 5 55.60	+ 4 8.22	+ 26.5	1 24 58.52	+ 0.16	75 16 51.5	+ 1.4
	31	ο Piscium (R.)	. .	. . .	. .	. .	149 35 54.62	+ 3 45.42	− 34.6	. . . .	. .	81 27 15.8	+ 0.9
	32	ο Piscium	. .	. . .	. .	. .	30 15 52.90	+ 4 26.43	+ 34.6	. . . .	. .	81 27 15.1	+ 0.2
	33	α Arietis (R.)	. .	. . .	. .	. .	163 55 53.25	+ 4 0.50	− 17.0	. . . .	. .	67 6 44.4	+ 0.2
	34	α Arietis	. .	. . .	. .	. .	15 56 1.35	+ 4 6.10	+ 17.0	. . . .	. .	67 6 45.7	+ 1.5
	35	Neptune.	9	18 49.06	− 0.82	− 20.37	26 53 59.52	+ 4 58.57	+ 30.1	2 18 27.87	. .	78 5 49.4	. .
	36	Moon II, N.	9	28 1.23	− 0.61	− 20.37	19 17 53.60	+ 4 20.43	+ 20.8	2 27 40.25	−67.36	70 28 56.0	. .
	37	α Ceti	9	56 16.70	− 1.02	**− 20.39**	35 12 2.42	+ 4 5.89	+ 41.9	2 55 55.31	+ 0.03	86 23 11.4	− 0.8
	38	β Leonis	9	43 10.21	− 0.60	**− 20.47**	23 33 47.75	+ 4 7.53	+ 25.4	11 42 49.15	0.00	74 44 41.9	+ 2.6
	39	12² Canum Venat.	9	50 38.19	+ 0.21	**− 20.45**	359 50 . .	. .	. .	12 50 17.94	+ 0.02	. . . .	. .
	40	Polaris, S. P.	7	15 59.66	−66.55	− 20.45	307 29 55.00	+ 4 35.39	− 1 14.1	1 14 32.66	− 1.16	358 39 37.5	0.0
3	41	β Aquarii	9	25 30.08	− 1.19	− 20.40	44 53 54.68	+ 5 12.74	+ 57.9	21 25 8.52	+ 0.04	96 6 26.5	+ 2.2
	42	ε Pegasi	9	38 33.10	− 0.81	− 20.33	29 29 55.75	+ 4 8.53	+ 32.9	21 38 11.91	− 0.05	80 40 58.4	+ 3.0
	43	α Aquarii	7	59 52.99	− 1.06	− 20.40	39 43 54.55	+ 3 37.86	+ 48.3	21 59 31.55	+ 0.04	90 54 41.9	+ 2.0
	44	B. A. C. 7923 (R.)	. .	. . .	. .	. .	170 37 47.35	+ 3 55.19	− 9.5	. . . .	. .	60 24 48.2	+29.0
	45	B. A. C. 7923	. .	. . .	. .	. .	9 13 43.25	+ 4 34.36	+ 9.5	. . . .	. .	60 24 48.3	+29.0
	46	Weisse 966	9	48 3.68	− 1.34	− 20.39	51 37 54.28	+ 4 46.63	+ 1 13.5	22 47 41.95	− 3.99	102 50 15.6	+19.4
	47	Mars I, S.	4	53 18.86	− 1.28	− 20.39	48 53 56.12	+ 4 57.27	+ 1 6.7	22 52 57.19	+ 0.74	100 6 21.3	. .
	48	Mars II, N.	5	53 20.24	− 1.28	− 20.39	48 53 56.12	+ 4 36.82	+ 1 6.7	22 52 58.57	− 0.64	100 6 0.8	. .
	49	Weisse 1204	9	58 28.92	− 1.34	− 20.39	51 37 54.55	+ 4 39.79	+ 1 13.5	22 58 7.19	− 4.03	102 50 9.0	+20.1
	50	Saturn I, S.	4	5 13.35	− 1.23	− 20.39	47 5 54.38	+ 5 40.64	+ 1 2.7	23 4 51.73	+ 0.71	98 18 58.9	. .

arom.	At. Ther.	Ex. Ther.
in.	°	°
30.01	60.7	60.0
29.92	51.6	49.5
29.99	48.2	45.0
30.02	47.6	43.0
30.04	47.5	42.5
30.14	52.5	54.0
30.12	56.5	54.5

For summary of the elements of reduction see page 3.

36. Three bisections.
2, 4, 17, 18. Four bisections.
28. Five bisections.

ZENITH-POINT CORR.

	″
No. 1 to 14	+ 61.54
No. 15 to 37	+ 62.01
No. 38 to 40	+ 61.81
No. 41 to 50	+ 61.22

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	− 0.1	. .	. .	− 0.1
35	− 0.1	. .	. .	− 0.1
36	−18 24.4	+ 15 18.6	. .	− 3 5.8
47	− 12.2	− 10.4	. .	− 22.6
48	− 12.2	+ 10.4	− 0.3	− 2.1
50	− 0.7	− 9.7	. .	− 10.4

DATE AND OBS'R.	Number.		OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
						Inst.	Clock.		Instrument.	Refraction.				
1877.					m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Oct. 23	1		Saturn II, N. .	5	5 14.76	− 1.23	− 20.39	47 5 54.38	+ 5 21.15	+ 1 2.7	23 4 53.14	− 0.70	98 18 39.4	.
E.	2	ψ^1	Aquarii . . .	9	9 52.61	− 1.26	− 20.39	48 33 55.82	+ 3 42.38	+ 1 5.9	23 9 30.96	− 4.01	99 45 5.3	+21
	3		Weisse 265 . .	9	14 54.46	− 1.30	− 20.39	49 59 56.95	+ 4 31.50	+ 1 9.4	23 14 32.77	− 4.05	101 11 59.0	+21
	4		Weisse 377 . .	9	20 39.24	− 1.29	− 20.40	49 31 54.15	+ 2 53.26	+ 1 8.1	23 20 17.55	− 4.06	100 42 16.7	+22
	5		Weisse 497 . .	9	26 29.36	− 1.31	− 20.40	50 29 58.90	+ 2 46.85	+ 1 10.5	23 26 7.65	− 4.09	101 40 17.5	+22
	6		Weisse 629 . .	9	32 17.11	− 1.26	− 20.40	48 7 55.72	+ 2 44.72	+ 1 4.9	23 31 55.45	− 4.07	99 18 6.5	+23
	7		B. A. C. 5 . .	9	2 50.56	− 1.10	− 20.40	41 41 55.98	+ 4 51.49	+ 52.0	0 2 29.06	− 4.07	92 54 0.7	+25
	8		Lamont 18 . .	9	6 47.49	− 1.08	− 20.40	40 41 55.28	+ 5 8.99	+ 50.2	0 6 26.01	− 4.07	91 54 15.7	+26
	9		B. A. C. 69 . .	9	15 14.31	− 2.16	− 20.40	78 39 56.75	+ 3 58.40	+ 4 44.2	0 14 51.75	− 4.80	129 55 0.6	+19
	10		Lacaille 61 . .	9	17 8.24	− 2.16	− 20.40	78 39 56.75	+ 5 18.63	+ 4 44.7	0 16 45.68	− 4.80	129 56 21.3	+19
	11		Lacaille 81 . .	9	19 44.59	− 2.16	− 20.40	78 39 56.75	+ 4 59.99	+ 4 44.7	0 19 22.03	− 4.79	129 56 2.6	+19
	12		B. A. C. 136^1 .	4	28 9.25	− 2.06	− 20.40	74 25 51.98	+ 3 48.74	+ 3 26.9	0 27 46.79	− 4.65	125 39 28.8	+20
	13		B. A. C. 136^2 .	5	28 9.33	− 2.06	− 20.40	74 25 51.98	+ 3 54.57	+ 3 26.9	0 27 46.87	− 4.65	125 39 34.7	+20
	14		Weisse (2) 1062	3	42 54.52	+ 0.16	− 20.41	358 23 51.68	+ 4 37.31	− 1.6	0 42 34.27	− 4.27	49 34 48.6	+30
	15		B. A. C. 227 .	7	43 26.61	+ 0.16	− 20.41	358 23 51.68	+ 4 47.39	− 1.5	0 43 6.36	− 4.28	49 34 58.8	+30
	16		Hera	9	54 15.97	− 1.10	− 20.41	41 15 50.38	+ 7 17.94	+ 51.4	0 53 54.46	. .	92 30 20.9	− 3
	17		Polaris . . .	8	13 51.48	+61.66	− 20.41	310 9 57.52	+ 5 12.85	− 1 8.8	1 14 32.73	− 1.12	1 20 22.8	+ 0.
	18		B. A. C. 646 . .	9	0 30.80	+ 1.26	− 20.42	340 59 55.90	+ 3 24.90	− 20.0	2 0 11.64	− 5.66	32 9 22.0	+25.
	19		Piazzi II, 10. .	9	5 13.02	− 2.23	− 20.42	80 9 52.30	+ 4 46.49	+ 5 27.5	2 4 50.39	− 4.49	131 26 27.5	+25.
	20		Neptune. . .	9	18 42.54	− 0.74	− 20.42	26 55 52.42	+ 3 41.41	+ 29.8	2 18 21.38	. .	78 6 24.8	.
	21		Lalande 4803 .	9	29 45.98	− 0.88	− 20.42	32 29 54.02	+ 4 41.50	+ 37.4	2 29 24.68	− 4.29	83 41 37.1	+27.
	22	γ	Ceti	9	37 21.42	− 0.96	− **20.51**	36 5 55.92	+ 3 34.56	+ 42.7	2 37 0.04	+ 0.08	87 16 34.4	+ 0.
	23		B. A. C. 863 (R.).	.	. . .	. .	. .	196 23 53.65	+ 5 32.17	+ 17.3	. . . .	. .	34 36 38.1	+21.
	24		B. A. C. 863. .	.	. . .	. .	. .	343 25 50.70	+ 4 44.42	− 17.3	. . . .	. .	34 36 39.0	+21.
	25	α	Ceti	9	56 16.68	− 0.94	− **20.44**	35 11 59.08	+ 4 10.10	+ 41.4	2 55 55.31	+ 0.02	86 23 11.8	− 0.
	26	48	Cephei . . .	8	5 12.92	+ 5.31	− 20.43	321 33 55.05	+ 3 27.44	− 46.3	3 4 57.80	0.00	12 42 57.4	− 0.
	27	ζ	Arietis . . .	9	8 15.38	− 0.50	− **20.35**	18 13 56.48	+ 3 44.53	+ 19.4	3 7 54.45	− 0.08	69 24 21.6	+ 1.
	28		Moon II, N. .	9	22 44.48	− 0.41	− 20.43	15 7 53.82	+ 4 24.43	+ 15.9	3 22 23.64	−70.11	66 18 55.3	.
P. 24	29	α	Aquarii . . .	9	59 53.22	− 1.05	− **20.66**	39 43 57.22	+ 3 35.13	+ 47.8	21 59 31.47	− 0.02	90 54 41.4	+ 1.
	30		Weisse (2) 175 .	9	8 50.39	− 0.58	− 20.70	21 23 53.35	+ 4 18.82	+ 22.6	22 8 29.11	− 3.27	72 34 56.0	+25.
	31	θ	Aquarii . . .	9	10 46.24	− 1.24	− **20.70**	47 11 53.42	+ 4 8.04	+ 1 2.1	22 10 24.31	+ 0.03	98 23 24.8	+ 1.
	32	π	Aquarii . . .	9	19 24.98	− 1.01	− **20.63**	38 3 57.02	+ 3 22.18	+ 45.0	22 19 3.28	− 0.03	89 14 25.4	+ 1.
	33	9	Draconis, S. P. .	5	25 7.54	− 7.70	− 20.69	295 11 51.72	+ 4 4.47	− 2 1.1	10 24 39.15	− 0.73	346 20 16.3	+ 1.
	34	η	Aquarii . . .	9	29 27.50	− 1.05	− **20.62**	39 33 58.97	+ 3 34.98	+ 47.5	22 29 5.76	− 0.03	90 44 42.7	+ 1.4
	35		Weisse (2) 710 .	9	32 19.50	+ 0.35	− 20.69	355 45 56.15	+ 3 43.36	− 4.2	22 31 59.16	− 3.04	46 55 56.5	+30.
	36		B. A. C. 7931^2 .	9	38 55.87	+ 0.16	− 20.69	359 59 54.80	+ 3 56.46	+ 0.1	22 38 35.34	− 3.16	51 10 12.6	+30.6
	37	λ	Aquarii . . .	3	46 37.68	− 1.23	− **20.72**	47 1 53.72	+ 4 25.26	+ 1 1.8	22 46 15.76	+ 0.13	98 13 42.0	+ 2.6
	38	α	Piscis Aust. .	9	51 18.14	− 1.84	− **20.82**	69 3 58.48	+ 3 22.13	+ 2 29.6	22 50 55.61	+ 0.14	120 16 11.4	+ 1.6
	39		Mars I, S. . .	4	54 5.13	− 1.27	− 20.69	48 43 57.62	+ 5 46.89	+ 1 5.7	22 53 43.17	+ 0.63	99 57 11.4	. .
	40		Mars II, N. . .	5	54 6.30	− 1.27	− 20.69	48 43 57.62	+ 5 28.43	+ 1 5.7	22 53 44.34	− 0.54	99 56 52.9	. .
	41	α	Pegasi . . .	7	59 3.04	− 0.65	− 20.68	24 15 55.05	+ 4 14.60	+ 26.0	22 58 41.71	+ 0.02	75 26 56.9	+ 2.8
	42		Saturn I, S. . .	4	5 4.80	− 1.23	− 20.68	47 7 59.10	+ 4 22.66	+ 1 2.1	23 4 42.89	+ 0.62	98 19 45.1	. .
	43		Saturn II, N. .	5	5 6.04	− 1.23	− 20.68	47 7 59.10	+ 4 6.09	+ 1 2.1	23 4 44.13	− 0.62	98 19 28.5	. .
	44		Durch. 62°, 2208	7	12 21.55	+ 1.82	− 20.68	336 21 55.32	+ 3 40.71	− 25.1	23 12 2.69	− 3.38	27 31 32.1	+32.
	45		Anonymous .	7	12 54.94	+ 1.82	− 20.68	336 21 55.32	+ 23.22	− 25.2	23 12 36.08	− 3.39	27 28 14.5	+32.
	46	θ	Piscium . . .	9	22 9.20	− 0.89	− 20.68	33 5 56.35	+ 4 26.73	+ 37.6	23 21 47.63	+ 0.11	84 17 21.9	+ 2.0
	47		B. A. C. 8245 .	9	36 35.57	+ 0.40	− 20.67	354 31 54 88	+ 2 41.29	− 5.5	23 36 15.30	− 3.70	45 40 51.9	+32.1
	48		O. Arg. N. 26144	9	48 2.10	+ 3.22	− 20.67	327 59 53.62	+ 5 27.03	− 35.9	23 47 44.65	− 4.35	19 11 5.9	+32.
	49		Durch. 70°, 1340	9	54 51.52	+ 3.22	− 20.67	327 59 53.62	+ 2 56.90	− 36.0	23 54 34.07	− 4.53	19 8 35.7	+32.
	50		Σ 3052^1 . . .	5	57 0.53	+ 3.20	− 20.67	328 7 57.50	+ 5 20.00	− 35.7	23 56 43.06	− 4.57	19 19 3.0	+32.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
9	30.13	54.5	52.5
28	30.12	52.0	49.5
29	30.04	59.6	58.3

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

33. Four bisections.
28. Five bisections.

No. 1 to 28 + 61″.22
No. 29 to 50 + 49.05

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 0.7	+ 9.8	. .	+ 9.1
20	− 0.1	. .	. .	− 0.1
28	−14 38.3	+ 15 26.8	. .	+ 0 48.5
39	− 12.0	− 9.4	. .	− 21.4
40	− 12.0	+ 9.4	− 0.3	− 2.9
42	− 0.7	− 8.3	. .	− 9.0
43	− 0.7	+ 8.3	. .	+ 7.6

ATE ND S'R.	Number.	Object.	Threads.	Mean Thread.	Corrections. Inst.	Corrections. Clock.	Zenith Dist. South, from Circles.	Corrections. Instrument.	Corrections. Refraction.	Apparent Right Ascension.	Miscellaneous Correction.	Apparent North-Polar Distance.	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
24	1	Σ 3052^2 . . .	5	57 1.51	+ 3.20	− 20.67	328 7 57.50	+ 4 46.12	− 35.7	23 56 44.04	− 4.57	19 18 29.1	+32.0
.	2	γ Pegasi (R.) . .	.	. . .	. .	. .	155 31 54.25	+ 5 21.28	− 26.2	. . . .	. .	75 29 31.9	+ 0.4
	3	γ Pegasi	.	. . .	. .	. .	24 17 57.95	+ 4 48.13	+ 26.2	. . . .	. .	75 29 33.5	+ 2.0
	4	B.A.C. 4165, S.P.	5	15 15.07	−54.61	− 20.67	307 13 52.90	+ 3 26.32	− 1 15.7	12 13 59.79	+19.85	358 22 24.7	+29.4
	5	12 Ceti	9	24 11.72	− 1.16	− 20.66	43 25 57.80	+ 4 34.61	+ 54.8	0 23 49.90	− 4.14	91 37 48.4	+26.3
	6	α Cassiopeæ (R.) .	.	. . .	. .	. .	196 53 53.05	+ 4 27.75	+ 17.6	. . . .	. .	34 7 42.8	− 1.5
	7	α Cassiopeæ . .	4	33 56.28	+ 1.12	− 20.66	342 57 58.52	+ 3 43.78	− 17.6	0 33 36 74	− 0.03	34 7 45.9	+ 1.6
	8	ε Piscium . . .	9	56 59.30	− 0.86	− **20.65**	31 33 58.02	+ 4 56.98	+ 35.6	0 56 37.78	− 0.02	82 45 51.8	− 0.3
	9	B. A. C. 345 . .	9	4 45.08	− 0.20	− 20.65	8 3 54.08	+ 2 54.06	+ 8.2	1 4 24.23	− 4.30	59 13 17.5	+29.8
	10	Polaris . . .	4	13 51.25	+63.20	− 20.65	310 9 54.72	+ 5 14.61	− 1 8.2	1 14 33.80	− 0.08	1 20 22.3	+ 0.4
	11	θ^1 Ceti	9	18 18.76	− 1.27	− **20.72**	47 37 57.78	+ 3 18.18	+ 1 3.4	1 17 56.84	+ 0.07	98 48 40.6	+ 2.0
	12	η Piscium . . .	9	25 19.74	− 0.68	− **20.61**	24 5 55.20	+ 4 9.72	+ 25.9	1 24 58.41	+ 0.04	75 16 52.0	+ 2.0
	13	υ Piscium . . .	9	39 19.74	− 0.84	− **20.64**	30 15 58.00	+ 4 22.44	+ 33.8	1 38 58.25	− 0.06	81 27 15.4	+ 0.6
	14	β Arietis . . .	9	48 16.43	− 0.53	− **20.67**	18 35 56.72	+ 4 33.11	+ 19.6	1 47 55.25	+ 0.04	69 47 10.6	+ 1.3
	15	50 Cassiopeæ . .	9	53 22.87	+ 3.44	− 20.65	326 59 56.85	+ 4 26.20	− 37.4	1 53 5.66	+ 0.33	18 10 6.8	− 0.1
	16	α Arietis . . .	9	0 40.04	− 0.46	− **20.59**	15 55 53.18	+ 4 13.87	+ 16.6	2 0 18.93	− 0.05	67 6 44.8	+ 0.8
	17	Lalande 3987 .	5	6 5.71	+ 2.41	− 20.65	331 41 54.18	+ 5 30.16	− 31.0	2 5 47.47	− 6.78	22 53 14.5	+24.3
	18	Bradley 329, (Mira.)	5	13 34.07	− 1.15	− 20.65	42 17 58.62	+ 6 32.17	+ 52.8	2 13 12.27	− 4.24	93 31 44.8	+27.5
	19	Piazzi II, 57. .	5	13 41.69	− 1.15	− 20.65	42 17 58.62	+ 6 16.73	+ 52.8	2 13 19.89	− 4.24	93 31 29.4	+27.5
	20	Neptune. . .	9	18 36.28	− 0.76	− 20.65	26 55 57.02	+ 4 8.98	+ 29.5	2 18 14.87	. .	78 6 56.7	. .
	21	ξ^2 Ceti	9	22 3.06	− 0.86	− 20.65	30 53 57.30	+ 4 11.58	+ 34.7	2 21 41.55	− 4.31	82 5 4.8	+27.2
	22	Lalande 4803 .	9	29 46.22	− 0.90	− 20.65	32 29 53.98	+ 4 43.73	+ 37.0	2 29 24.67	− 4.30	83 41 35.9	+27.1
	23	γ^2 Ceti	9	37 21.64	− 0.99	− 20.65	36 5 56.95	+ 3 33.01	+ 42.3	2 37 0.00	+ 0.03	87 16 33.5	− 0.2
	24	O. Arg. N. 3176.	9	43 0.16	+ 7.14	− 20.65	319 3 55.15	+ 5 11.80	− 50.0	2 42 46.65	−12.55	10 14 38.2	+19.0
	25	O. Arg. N. 3326.	7	53 0.24	+ 7.14	+ 20.65	319 3 54.68	+ 1 21.95	− 50.2	2 52 46.73	−12.89	10 10 47.6	+17.9
	26	α Persei (R.) . .	.	. . .	. .	. .	190 27 52.82	+ 3 54.99	+ 10.8	. . . .	. .	40 34 22.6	− 0.6
	27	α Persei . . .	3	15 58.53	+ 0.62	− 20.65	349 23 53.35	+ 4 18.92	− 10.8	3 15 38.50	+ 0.02	40 34 22.7	− 0.5
	28	Lalande (F.) 519.	5	26 56.25	+21.61	− 20.65	312 33 55.78	+ 5 14.89	− 1 3.2	3 26 57.21	−32.17	3 44 28.7	+13.0
	29	η Tauri (R.) . .	.	. . .	. .	. .	164 45 52.90	+ 4 28.25	− 15.7	. . . .	. .	66 16 15.7	+ 0.7
	30	η Tauri . . .	.	. . .	. .	. . .	15 5 56.45	+ 3 41.53	+ 15.7	. . . .	. .	66 16 14.9	− 0.1
	31	ζ Persei . . .	9	46 49.84	− 0.19	− **20.61**	7 17 54.68	+ 4 16.96	+ 7.5	3 46 29.00	− 0.02	58 28 40.3	− 0.4
	32	γ^1 Eridani . .	9	52 43.60	− 1.42	− **20.71**	52 39 58.75	+ 3 32.65	+ 1 16.1	3 52 21.53	+ 0.09	103 51 8.7	+ 0.6
	33	B. A. C. 1247 .	5	0 22.48	+11.94	− 20.65	315 19 54.62	+ 4 26.94	− 57.2	4 0 13.77	−20.66	6 29 45.6	+ 9.1
	34	γ Tauri . . .	9	13 13 50	− 0.68	− **20.72**	23 27 57.98	+ 5 11.12	+ 25.3	4 12 52.17	+ 0.09	74 39 55.6	+ 0.9
	35	Moon II, N. .	5	21 33.17	− 0.35	− 20.65	12 13 54.08	+ 3 3.06	+ 12.6	4 21 12.17	−72.61	63 23 30.9	. .
	36	α Tauri . . .	9	29 17.54	− 0.66	− **20.66**	22 33 54.68	+ 3 24.25	+ 24.2	4 28 56.23	0.00	73 44 4.3	+ 1.0
	37	B. A. C. 1448 .	5	37 53.19	+ 8.18	− 20.66	317 51 53.48	+ 3 31.88	− 52.4	4 37 40.71	−16.11	9 0 54.2	+ 4.5
	38	9 Camelop. . .	9	42 16.51	+ 2.21	− 20.66	332 41 56.22	+ 4 17.24	− 29.9	4 41 58.06	+ 0.33	23 52 4.8	+ 2.0
	39	ι Aurigæ . .	9	49 24.72	− 0.16	− **20.57**	5 49 55.82	+ 5 15.18	+ 6.0	4 49 3.90	− 0.07	57 1 38.2	+ 1.4
	40	ε Ursæ Min., S.P..	8	58 58.36	−12.00	− 20.66	301 5 56.85	+ 3 31.13	− 1 35.8	16 58 25.70	− 0.08	352 14 13.4	+ 0.8
31	41	ε Pegasi . . .	9	38 34.24	− 0.89	− **21.50**	29 29 57.30	+ 4 6.14	+ 32.9	21 38 11.86	+ 0.01	80 40 57.5	+ 2.1
	42	μ Capricorni . .	9	47 1.93	− 1.44	− **21.47**	52 55 53.58	+ 4 2.82	+ 1 16.8	21 46 39.00	− 0.02	104 7 34.4	+ 2.6
	43	α Aquarii . . .	9	59 54.07	− 1.13	− **21.51**	39 44 0.10	+ 3 31.46	+ 48.3	21 59 31.45	+ 0.04	90 54 41.1	+ 1.0
	44	B. A. C. 7743 .	9	6 20.89	+ 0.14	− 21.49	356 25 55.10	+ 1 43.90	− 3.6	22 5 59.54	− 2.64	47 33 56.6	+30.6
	45	B. A. C. 7770 .	9	9 58.49	+ 0.14	− 21.49	356 25 55.10	+ 6 37.38	− 3.5	22 9 37.14	− 2.68	47 38 50.2	+30.8
	46	Lalande 43567 .	9	14 19 89	− 1.48	− 21.48	53 55 55.92	+ 6 24.83	+ 1 19.9	22 13 56.93	− 3.83	105 10 1.9	+15.6
	47	Lalande 43596 .	9	15 23.68	− 1.48	− 21.48	53 55 55.92	+ 39.24	+ 1 19 7	22 15 0.72	− 3.83	105 4 16.1	+15.7
	48	Weisse 966 . .	9	48 4.67	− 1.42	− 21.48	51 37 50.82	+ 4 49.64	+ 1 13.7	22 47 41.77	− 3.92	102 50 15.6	+18.8
	49	Weisse 1047 .	9	52 6.34	− 1.40	− 21.48	50 35 56.98	+ 3 31.92	+ 1 11.0	22 51 43.46	− 3.92	101 47 1.1	+19.4
	50	Mars I, S. . .	4	0 29.45	− 1.33	− 21.47	47 35 54.48	+ 4 37.59	+ 1 4.0	23 0 6.65	+ 0.58	98 47 57.3	. .

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.03	56.5	55.3
30.01	55.8	54.2
29.99	54.6	53.0
29.97	52.6	51.0
29.87	52.0	50.5

For summary of the elements of reduction see page 3.

15. One bisection.
10, 33, 35, 37, 40. Three bisections.
4, 28. Five bisections.

ZENITH-POINT CORR.

No. 1 to 40 + 49″.05
No. 41 to 50 + 50.40

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
20	− 0.1	. .	. .	− 0.1
35	−11 56.9	+ 15 35.0	. .	+ 3 38.1
50	− 10.9	− 8.9	. .	− 19.8

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
1877.		.		m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	'
Oct. 31	1	Mars II, N. . .	5	0 30.52	— 1.33	— 21.47	47 35 54.48	+ 4 20.07	+ 1 4.0	23 0 7.72	— 0.49	98 47 39.8	.
E.	2	Saturn I, S. . .	4	4 12.68	— 1.32	— 21.47	47 11 55.50	+ 4 49.62	+ 1 3.1	23 3 49.89	+ 0.70	98 24 9.4	.
	3	Saturn II, N. .	5	4 14.08	— 1.32	— 21.47	47 11 55.50	+ 4 30.34	+ 1 3.1	23 3 51.29	— 0.70	98 23 50.4	.
	4	ψ¹ Aquarii . . .	9	9 53.62	— 1.35	— 21.47	48 33 58.15	+ 3 41.48	+ 1 6.1	23 9 30.80	— 3.95	99 45 6.9	+21.
	5	Hera	9	49 14.14	— 1.21	— 21.46	41 41 54.18	+ 7 43.82	+ 52.6	0 48 51.47	. .	92 56 51.8	— 3.
	6	β Andromedæ .	9	3 16.88	— 0.18	— 21.46	3 51 53.30	+ 3 5.75	+ 4.0	1 2 55.24	— 4.36	55 1 24.2	+31.
	7	Polaris . . .	5	13 55.53	+58.28	— 21.45	310 9 51.92	+ 5 17.42	— 1 9.4	1 14 32.36	— 0.39	1 20 21.1	+ 2
	8	o Piscium . . .	9	39 20.64	— 0.94	— **21.41**	30 15 52.08	+ 4 26.95	+ 34.5	1 38 58.25	— 0.09	81 27 14.7	0
	9	B. A. C. 569 (R.)	.	. . .	. .	. .	170 1 47.62	+ 3 54.53	— 10.3	. . . .	. .	61 0 49.3	+29.
	10	B. A. C. 569 .	.	. . .	. .	. .	9 49 50.00	+ 4 24.76	+ 10.3	. . . .	. .	61 0 46.3	+29.
	11	B. A. C. 609 . .	9	53 17.53	— 0.86	— 21.44	27 5 56.38	+ 4 54.38	+ 30.3	1 52 55.23	— 4.35	78 17 42.3	+28.
	12	α Arietis . . .	9	0 41.02	— 0.57	— **21.40**	15 55 56.18	+ 4 10.74	+ 16.9	2 0 19.01	— 0.03	67 6 45.0	+ 1.
	13	ξ¹ Ceti	9	6 55.71	— 0.94	— **21.49**	30 31 56.40	+ 4 32.81	+ 34.9	2 6 33.33	+ 0.13	81 43 25.3	+ 0.
	14	ι Cassiopeæ (R.) .	.	. . .	. .	. .	207 51 51.50	+ 5 17.41	+ 31.3	. . . .	. .	23 8 41.0	— 2.
	15	ι Cassiopeæ . .	6	19 23.71	+ 2.08	— 21.44	331 58 0.92	+ 4 54.49	— 31.3	2 19 4.35	+ 0.27	23 8 45.3	+ 1.
P.	16	Polaris, S. P. .	8	15 55.02	—60.84	— 21.89	307 30 . .	. . .	. .	1 14 32.29	— 0.33	. . . .	.
	17	α Virginis . . .	9	19 7.83	— 1.15	— **22.00**	49 20 1.48	+ 3 47.73	+ 1 7.8	13 18 44.79	+ 0.08	100 31 18.2	— 1.
	18	η Bootis . . .	9	49 13.58	— 0.46	— **21.76**	19 48 . .	. . .	. .	13 48 51.25	— 0.15	. . . .	.
	19	Mercury C. . .	9	1 0.59	— 1.17	— 21.87	49 52 0.52	+ 4 51.35	+ 1 8.9	14 0 37.55	0.00	101 4 22.0	.
Nov. 1	20	Sun I, N. . .	9	27 14.63	— 1.26	— 21.85	53 9 59.48	+ 4 21.54	+ 1 17.3	14 26 51.58	+66.96	104 21 59.5	.
	21	Sun II, S. . .	9	29 28.56	— 1.26	— 21.85	53 41 58.82	+ 4 37.63	+ 1 18.8	14 29 5.45	—66.97	104 54 16.4	.
	22	β Ursæ Minoris .	5	51 18.56	+ 4.16	— 21.84	324 9 56.90	+ 5 12.74	— 41.6	14 51 0.88	— 0.29	15 20 49.2	— 0.
	23	η Herculis . .	9	39 3.06	+ 0.16	— **21.75**	359 39 57.15	+ 4 21.09	— 0.3	16 38 41.43	— 0.04	50 50 39.1	+ 2.
	24	κ Ophiuchi . .	9	52 15.04	— 0.70	— **21.82**	29 13 55.72	+ 5 13.97	+ 32.2	16 51 52.56	+ 0.11	80 26 3.1	+ 2.
	25	Venus I, S. . .	9	29 51.71	— 1.53	— 21.76	64 34 0.28	+ 4 37.95	+ 2 0.6	17 29 28.42	+ 0.65	115 47 0.0	. .
	26	Venus N. . . .	.	. . .	. .	. .	64 34 0.28	+ 4 22.54	+ 2 0.6	. . . .	. .	115 46 44.6	. .
S. 2	27	Mars I, S. . .	4	2 37.98	— 1.30	— 21.66	47 11 58.85	+ 7 18.51	+ 1 2.4	23 2 15.02	+ 0.74	98 26 41.0	. .
	28	Mars II, N. . .	5	2 39.34	— 1.30	— 21.66	47 11 58.85	+ 6 59.42	+ 1 2.4	23 2 16.38	— 0.62	98 26 21.9	. .
	29	θ Piscium . . .	9	22 10.14	— 0.95	— **21.68**	33 5 57.92	+ 4 24.78	+ 37.7	23 21 47.52	+ 0.06	84 17 21.6	+ 1.
	30	Weisse 497 . .	8	26 30.55	— 1.38	— 21.67	50 29 55.92	+ 2 52.25	+ 1 10.0	23 26 7.50	— 4.02	101 40 19.4	+21.
	31	Weisse 586 . .	9	30 6.36	— 1.33	— 21.67	48 15 55.92	+ 2 27.59	+ 1 4.8	23 29 43.36	— 4.00	99 26 19.5	+22.
	32	ω Piscium . . .	2	53 26.35	— 0.94	— **21.73**	32 38 2.30	+ 3 36.07	+ 37.1	23 53 3.74	+ 0.06	83 48 36.7	+ 1.1
	33	α Andromedæ . .	9	2 27.71	— 0.30	— **21.61**	10 23 55.72	+ 4 20.81	+ 10.7	0 2 5.74	— 0.03	61 34 48.4	+ 1.4
	34	γ Pegasi . . .	9	7 20.44	— 0.72	— **21.58**	24 17 56.15	+ 4 49.35	+ 26.2	0 6 58.05	— 0.08	75 29 32.9	+ 1.8
	35	β Ceti	9	37 52.54	— 1.58	— **21.76**	57 27 55.38	+ 3 33.09	+ 1 30.8	0 37 29.28	+ 0.14	108 39 20.5	+ 0.9
	36	Anonymous .	3	55 19.74	— 0.99	— 21.68	34 43 55.55	+ 6 16.94	+ 40.4	0 54 57.07	— 4.17	85 57 14.1	+28.0
	37	Polaris . . .	5	13 50.28	+63.29	— 21.68	310 9 55.82	+ 5 11.00	— 1 8.6	1 14 31.89	— 0.39	1 20 19.4	+ 0.9
	38	B. A. C. 587 . .	9	50 43.98	+ 0.46	— 21.69	352 19 59.00	+ 3 41.07	— 7.8	1 50 22.75	— 5.03	43 29 53.5	+29.3
	39	σ Arietis . . .	9	0 41.19	— 0.48	— 21.69	15 55 56.12	+ 4 10.57	+ 16.8	2 0 19.02	— 0.04	67 6 44.7	+ 1.5
	40	Neptune. . .	9	17 39.09	— 0.79	— 21.69	26 59 54.82	+ 5 9.24	+ 29.9	2 17 16.61	. .	78 11 55.2	. .
	41	Anonymous .	7	22 13.28	— 0.21	— 21.69	7 49 59.82	+ 6 28.41	+ 8.2	2 21 51.38	— 4.76	59 2 57.6	+27.4
	42	5 Ursæ Min., S. P. .	9	28 13.83	— 7.30	— 21.69	295 5 54.15	+ 3 59.37	— 2 3.8	14 27 44.84	+ 0.39	346 14 10.9	— 0.
	43	B. A. C. 863 (R.) .	.	. . .	. .	. .	196 23 50.40	+ 5 38.91	+ 17.3	. . . .	. .	34 36 34.6	+24.6
	44	B. A. C. 863 . .	.	. . .	. .	. .	343 25 56.22	+ 4 35.69	— 17.3	. . . .	. .	34 36 35.8	+24.6
	45	Aglaia . . .	9	59 30.09	— 0.50	— 21.69	16 30 0.08	+ 4 58.17	+ 17.4	2 59 7.90	. .	67 41 36.8	— 1.
	46	Alceste . . .	9	8 15.00	— 0.71	— 21.70	24 1 53.50	+ 6 40.01	+ 26.8	3 7 52.59	. .	75 15 21.5	— 1.
	47	η Tauri (R.) . .	.	. . .	. .	. .	164 45 54.20	+ 4 28.91	— 15.9	. . . .	. .	66 16 14.0	— 0.
	48	η Tauri. . . .	.	. . .	. .	. .	15 6 1.08	+ 3 37.63	+ 15.9	. . . .	. .	66 16 15.8	+ 1.
	49	ζ Persei . . .	9	46 51.13	— 0.20	— **21.70**	7 18 . .	. . .	. .	3 46 29.23	+ 0.02	. . . .	. .
	50	γ¹ Eridani . . .	2	52 44.87	— 1.45	— **21.79**	52 39 58.05	+ 3 35.60	+ 1 16.8	3 52 21.72	+ 0.12	103 51 11.6	+ 2.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
7	29.94	46.0	44.0
15	29.94	46.0	42.5
16	30.12	52.2	51.7
19	30.09	53.8	54.0
21	30.08	54.4	55.2
22	30.07	54.5	54.8
23	30.03	57.5	57.7
26	30.03	57.8	57.7
28	29.71	52.6	50.6
35	29.76	50.9	48.5
39	29.79	48.8	45.3

For summary of the elements of reduction see page 3.

48. One bisection.
7, 37. Three bisections.
19. Four bisections.

ZENITH-POINT CORR.

No. 1 to 15 + 50."40
No. 17 to 26 + 49.33
No. 27 to 50 + 50.51

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
1	— 10.9	+ 8.9	— 0.3	— 2.
2	— 0.7	— 9.5	. .	— 10.
3	— 0.7	+ 9.5	. .	+ 8.
19	— 4.9	. .	— 0.0	— 4.
20	— 7.1	+ 16 8.4	. .	+ 16 1.
21	— 7.2	— 16 8.4	. .	— 16 15.
25	— 8.3	— 7.7	0.0	— 16.
26	— 8.3	+ 7.7	. .	— 0.
27	— 10.6	— 9.7	. .	— 20.
28	— 10.6	+ 9.7	— 0.3	— 1.
40	— 0.1	. .	. .	— 0.

'E D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
7.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
2	1	Thetis . . .	9	6 48 49	− 0.77	− 21.70	26 5 54.60	+ 7 10.27	+ 28.9	4 6 26.02	. .	77 19 55.0	− 2.1
	2	γ Tauri . . .	9	13 14.64	− 0.70	− **21.65**	23 27 56.22	+ 5 13.91	+ 25.6	4 12 52.24	− 0.03	74 39 56.9	+ 2.2
	3	ε Tauri . . .	9	21 53.11	− 0.60	− **21.70**	19 53 53.58	+ 4 44.12	+ 21.3	4 21 30.80	0.00	71 5 20.2	+ 1.5
	4	Polaris, S. P. .	5	15 56.82	−66.94	− 22.07	307 29 58.40	+ 4 36.22	− 1 15.5	1 14 27.81	− 4.37	358 39 40.3	− 1.4
	5	η Bootis . . .	9	49 14.07	− 0.59	− **22.10**	19 47 53.30	+ 4 46.72	+ 21.0	13 48 51.44	+ 0.02	70 59 22.2	− 0.2
	6	α Bootis . . .	9	10 27.17	− 0.56	− **21.97**	18 59 58.52	+ 4 16.32	+ 20.0	14 10 4.58	− 0.04	70 10 56.0	+ 4.1
3	7	Sun I, S. . .	9	35 7.80	− 1.50	− 22.01	54 19 59.95	+ 4 22.87	+ 1 20.6	14 34 44.29	+67.30	105 32 4.6	. .
	8	Sun II, N. . .	9	37 22.39	− 1.50	− 22.01	53 48 4.60	+ 3 58.99	+ 1 19.0	14 35 58.88	−67.29	104 59 43.8	. .
	9	α Serpentis . .	9	38 37.16	− 0.92	− **21.94**	31 59 57.88	+ 4 28.23	+ 36.2	15 38 14.28	+ 0.01	83 11 23.5	+ 3.1
	10	α Scorpii . . .	9	22 17.92	− 1.81	− **21.84**	64 56 . .	. .	. .	16 21 54.18	− 0.11	. . . .	. .
	11	α^1 Herculis. . .	9	9 26.62	− 0.72	− **21.91**	24 15 57.75	+ 5 25.39	+ 26.2	17 9 4.00	+ 0.03	75 28 10.5	+ 3.2
	12	α Ophiuchi . .	9	29 37.96	+ 0.77	− **21.94**	26 9 52.25	+ 4 17.39	+ 28.5	17 29 15.30	+ 0.09	77 20 59.3	+ 2.1
	13	Venus I, N. .	9	40 6.63	− 1.81	− 21.88	64 44 0.70	+ 4 17.02	+ 2 2.5	17 39 42.94	+ 0.67	115 56 41.4	. .
	14	Venus S. . . .	.	. . . .	. .	. .	64 44 0.70	+ 4 36.62	+ 2 2.5	. . . .	. .	115 57 1.2	. .
	15	μ Herculis. . .	9	42 2.24	− 0.32	− 21.93	11 1 56.15	+ 3 52.44	+ 11.4	17 41 40.04	+ 0.09	62 12 21.2	+ 1.7
	16	α Pegasi . . .	9	59 4.40	− 0.75	− **22.04**	24 15 59.90	+ 4 6.95	+ 26.8	22 58 41.55	− 0.04	75 26 54.8	+ 1.0
	17	Saturn I, S. .	4	3 55.98	− 1.35	− 22.10	47 13 59.45	+ 3 59.85	+ 1 4.1	23 3 32.53	+ 0.65	98 25 24.6	. .
	18	Saturn II, N. .	5	3 57.28	− 1.35	− 22.10	47 13 59.48	+ 3 42.00	+ 1 4.1	23 3 33.83	− 0.65	98 25 6.8	. .
	19	Weisse (2) 1027.	9	50 52.03	− 0.55	− 22.07	16 50 2.65	+ 4 57.75	+ 18.1	23 50 29.41	− 3.79	68 1 39.7	+30.6
	20	α Andromedæ .	9	2 28.18	− 0.34	− **22.04**	10 24 2.58	+ 4 12.59	+ 11.0	0 2 5.77	0.00	61 34 47.4	+ 0.5
	21	γ Pegasi . . .	9	7 20.97	− 0.76	− **22.08**	24 18 6.32	+ 4 36.72	+ 27.0	0 6 58.14	+ 0.02	75 29 31.2	+ 0.2
	22	Polaris . . .	5	13 53.80	+62.71	− 22.04	310 9 54.12	+ 5 11.71	− 1 10.4	1 14 34.47	+ 2.38	1 20 16.6	− 1.5
	23	θ^1 Ceti	9	18 20.29	− 1.39	− **22.11**	47 38 0.72	+ 3 14.44	+ 1 5.5	1 17 56.86	+ 0.07	98 48 41.9	+ 2.3
	24	η Piscium . . .	9	25 21.34	− 0.78	− **22.06**	24 6 2.30	+ 3 50.55	+ 26.8	1 24 58.53	+ 0.11	75 16 49.8	+ 0.3
	25	B. A. C. 501. .	9	33 44.16	+ 0.18	− 22.03	356 10 9.85	+ 2 33.80	− 4.0	1 33 22.31	− 4.76	47 19 0.8	+30.6
	26	B. A. C. 508. .	2	34 35.18	+ 1.18	− 22.03	340 49 59.60	+ 3 12.04	− 20.7	1 34 14.33	− 5.44	31 59 12.1	+30.5
	27	ο Piscium . . .	9	39 21.24	− 0.95	− **21.98**	30 16 3.20	+ 4 15.13	+ 35.0	1 38 58.26	− 0.10	81 27 14.5	− 0.2
	28	β Arietis (R) . .	.	. . . .	. .	. .	161 13 58.65	+ 5 32.44	− 20.2	. . . .	. .	69 47 10.3	+ 1.8
	29	β Arietis . . .	.	. . . .	. .	. .	18 36 1.32	+ 4 25.73	+ 20.2	. . . .	. .	69 47 8.4	− 0.1
	30	α Arietis . . .	9	0 41.62	− 0.55	− **22.00**	15 55 54.80	+ 4 10.93	+ 17.2	2 0 19.05	− 0.01	67 6 44.1	+ 1.0
	31	ξ^1 Ceti	9	6 56.31	− 0.96	− **22.05**	30 32 0.95	+ 4 26.71	+ 35.5	2 6 33.34	+ 0.12	81 43 24.4	0.0
	32	Neptune. . .	7	17 33.04	− 0.87	− 22.01	27 0 0.25	+ 5 36.86	+ 30.7	2 17 10.16	. .	78 12 29.0	. .
	33	Anonymous .	9	22 1.50	− 0.30	− 22.01	7 53 17.50	+ 5 22.43	+ 8.5	2 21 39.19	− 4.76	59 5 9.6	+27.6
	34	Aglaia . . .	9	58 34.26	− 0.60	− 21.99	16 31 59.58	+ 5 25.16	+ 18.0	2 58 11.67	. .	67 44 3.9	− 1.3
	35	Alceste . . .	9	7 20.98	− 0.81	− 21.98	24 6 1.28	+ 7 10.92	+ 27.1	3 6 58.19	. .	75 20 0.5	− 2.0
	36	α Persei (R.) . .	.	. . . .	. .	. .	190 28 1.00	+ 3 50.69	+ 11.2	. . . .	. .	40 34 18.3	− 2.7
	37	α Persei . . .	.	. . . .	. .	. .	349 24 4.55	+ 4 8.79	− 11.2	. . . .	. .	40 34 23.3	+ 2.3
6	38	Polaris, S. P. .	5	16 0.42	−66.70	− 23.31	307 30 5.05	+ 4 33.10	− 1 18.4	1 14 30.41	− 1.10	358 39 41.0	− 2.2
	39	η Ursæ Majoris .	9	43 5.17	+ 0.71	− 23.31	348 53 54.82	+ 4 37.29	− 11.8	13 42 42.57	− 0.09	40 4 41.5	− 2.2
	40	η Bootis . . .	9	49 15.32	− 0.58	− **23.30**	19 47 55.78	+ 4 44.52	+ 21.8	13 48 51.43	− 0.05	70 59 23.3	− 0.1
	41	α Bootis . . .	9	10 28.56	− 0.55	− **23.33**	19 0 2.72	+ 4 11.20	+ 20.8	14 10 4.69	+ 0.03	70 10 55.9	+ 3.0
7	42	Sun I . . .	9	51 5.07	− 1.53	− 23 33	55 0 . .	. .	. .	14 50 40 21	+67.70	. . . .	. .
	43	Sun II . . .	9	53 20.47	− 1.53	− 23.33	55 32 . .	. .	. .	14 52 55.61	−67.70	. . . .	. .
	44	τ Herculis. . .	9	16 25.78	+ 0.54	− 23.34	352 11 58.48	+ 5 32.28	− 8.1	16 16 2.98	+ 0.25	43 23 43.9	+ 1.6
	45	α Scorpii . . .	9	22 19.39	− 1.81	− **23.31**	64 55 57.75	+ 5 12.63	+ 2 7.2	16 21 54.24	− 0.05	116 9 38.8	+ 0.7
	46	ζ Ophiuchi . .	9	30 49.96	− 1.35	− **23.36**	49 8 4.92	+ 3 35.11	+ 1 8.8	16 30 25.26	+ 0.01	100 19 10.0	+ 2.5
	47	η Herculis . .	9	39 4.68	+ 0.17	− **23.44**	359 39 50.75	+ 4 28.91	− 0.3	16 38 41.50	+ 0.09	50 50 40.6	+ 2.6
	48	ω Draconis . .	4	37 57.76	+ 2.91	− 23.36	330 1 56.98	+ 3 20.93	− 34.2	17 37 37.31	+ 0.04	21 11 4.9	− 0.9
	49	μ Herculis . .	9	42 3.50	− 0.27	− **23.28**	11 1 51.78	+ 3 56.26	+ 11.6	17 41 39.87	− 0.04	62 12 20 8	+ 0 5
	50	γ Draconis . .	9	54 7.40	+ 0.85	− 23.36	347 19 53.08	+ 3 39.41	− 13.3	17 53 44.89	− 0.09	38 29 40.4	− 0.1

Barom.	At. Ther.	Ex. Ther.
in.	°	°
29.84	47.8	44.3
30.03	51.5	51.5
30.02	53.7	54.2
30.05	55.0	54.0
30.14	47.4	44.6
30.17	44.8	41.5
30.19	44.6	41.2
30.20	43.2	40.0
30.21	42.2	38.5
30.21	41.8	37.8
30.50	40.2	40.5
30.48	43.4	43.4
30.45	48.5	47.0

For summary of the elements of reduction see page 3.

24. One bisection.
38. Three bisections.
21, 31. Four bisections.
4, 22. Five bisections.

ZENITH-POINT CORR.	"
No. 1 to 3	+ 50.51
No. 4 to 15	+ 48.49
No. 16 to 37	+ 49.55
No. 38 to 50	+ 47.82

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
7	− 7.3	− 16 10.4	. .	− 16 17.7
8	− 7.2	+ 16 10.4	. .	+ 16 3.2
13	− 8.4	+ 9.9	. .	+ 1.5
14	− 8.4	− 9.9	0.0	− 18.3
17	− 0.7	− 8.9	. .	− 9.6
18	− 0.7	+ 8.9	. .	+ 8.2
32	− 0.1	. .	. .	− 0.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Nov. 7	1	Venus I, N.	9	0 35.96	− 1.81	− 23.36	64 55 46.20	+ 3 47.00	+ 2 6.5	18 0 10.79	+ 0.69	116 8 0.9	.
F.	2	Venus, S.	.	. . .	. .	. .	64 55 46.20	+ 4 6.49	+ 2 6.6	. . . .	. .	116 8 20.5	.
	3	η Serpentis	9	15 23.47	− 1.15	**− 23.37**	41 43 49.15	+ 4 42.77	+ 53.0	18 14 58.95	+ 0.10	92 55 46.1	+ 0
	4	O. Arg. N. 23109	8	52 45.32	+ 0.66	− 23.51	350 39 48.82	+ 8 24.49	− 9.7	21 52 22.47	− 2.15	41 54 28.8	+31
	5	Lalande 43567	9	14 21.80	− 1.48	− 23.51	53 55 52.25	+ 6 27.49	+ 1 22 8	22 13 56.81	− 3.74	105 10 3.7	+15
	6	Lalande 43596	9	15 25.57	− 1.48	− 23.51	53 55 52.25	+ 40.31	+ 1 22.5	22 15 0.58	− 3.74	105 4 16.3	+15
	7	π Aquarii	7	19 27.73	− 1.04	**− 23.50**	38 3 59.15	+ 3 18.47	+ 47.2	22 19 3.18	+ 0.02	89 14 26.0	+ 1
	8	η Aquarii	9	29 30.26	− 1.08	**− 23.50**	39 34 1.10	+ 3 31.43	+ 49.8	22 29 5.67	+ 0.03	90 44 43.5	+ 1
	9	ζ Pegasi	9	35 47.37	− 0.79	**− 23.51**	28 37 59.80	+ 3 18.34	+ 33.0	22 35 23.07	+ 0.09	79 48 12.3	+ 1
	10	Weisse 1047	9	52 8.49	− 1.38	− 23.51	50 35 55.20	+ 3 33.66	+ 1 13.4	22 51 43.60	− 3.84	101 47 3.5	+18
	11	Weisse 1156	9	56 34.43	− 1.38	− 23.51	50 43 59.45	+ 3 42.18	+ 1 13.7	22 56 9.54	− 3.86	101 55 16.5	+19
	12	Weisse 1204	9	58 31.82	− 1.41	− 23.51	51 37 52.48	+ 4 40.17	+ 1 16.2	22 58 6.90	− 3.88	102 50 10.0	+19
	13	Weisse 1249	9	1 0.60	− 1.43	− 23.51	52 11 51.40	+ 3 38.17	+ 1 17.7	23 0 35.66	− 3.90	103 23 8.5	+19
	14	Weisse 123	9	8 44.41	− 1.37	− 23.51	50 9 49.28	+ 3 43.77	+ 1 12.3	23 8 19.53	− 3.90	101 21 6.5	+20
	15	Lalande 45504	7	9 24.70	− 1.39	− 23.51	51 1 54.10	+ 4 16.68	+ 1 14.5	23 8 59.80	− 3.92	102 13 46.5	+19
	16	ψ³ Aquarii	9	13 2.64	− 1.34	− 23.51	49 5 57.65	+ 3 10.59	+ 1 9.6	23 12 37.79	− 3.90	100 16 39.0	+20.
	17	Weisse 309	9	17 6.45	− 1.37	− 23.51	50 15 58.15	+ 2 59.31	+ 1 12.5	23 16 41.57	− 3.94	101 26 31.2	+20.
	18	Weisse 402	9	22 10.10	− 1.39	− 23.51	50 55 58.10	+ 3 41.10	+ 1 14.3	23 21 45.20	− 3.96	102 7 14.7	+20.
	19	Weisse 497	9	26 32.36	− 1.38	− 23.51	50 29 49.10	+ 2 54.96	+ 1 13.1	23 26 7.47	− 3.97	101 40 18.4	+21.
	20	Weisse 571	9	29 34.66	− 1.36	− 23.51	50 1 54.22	+ 4 16.60	+ 1 12.0	23 29 9.79	− 3.98	101 13 44.0	+21.
	21	Weisse 629	9	32 20.22	− 1.31	− 23.51	48 6 0.08	+ 4 39.45	+ 1 7.3	23 31 55.40	− 3.96	99 18 8.0	+22.
	22	γ Pegasi	9	7 22.28	− 0.67	**− 23.50**	24 17 52.45	+ 4 51.52	+ 27.4	0 6 58.09	− 0.01	75 29 32.6	+ 1.
	23	β Ceti	9	37 54.33	− 1.59	**− 23.56**	57 28 0.88	+ 3 24.28	+ 1 34.9	0 37 29.22	+ 0.10	108 39 21.3	+ 1.
	24	Weisse (2) 1062.	8	42 57.69	+ 0.24	− 23.52	358 23 58.08	+ 4 28.79	− 1.6	0 42 34.41	− 4.24	49 34 46.5	+33.
	25	B. A. C. 227	8	43 29.74	+ 0.24	− 23.52	358 23 58.08	+ 4 38.69	− 1.6	0 43 6.46	− 4.24	49 34 56.4	+33.
	26	Polaris	5	13 48.62	+65.24	− 23.52	310 10 3.90	+ 5 4.59	− 1 11.7	1 14 30.34	− 1.10	1 20 18.0	+ 1.
	27	η Piscium	9	25 22.64	− 0.67	**− 23.46**	24 5 49.70	+ 4 12.49	+ 27.3	1 24 58.45	+ 0.02	75 16 50.7	+ 1.
	28	Anonymous	5	33 31.30	− 0.47	− 23.52	17 29 52.22	+ 6 27.96	+ 19.3	1 33 7.31	− 4.39	68 43 0.7	+29.
	29	β Arietis	9	48 19.40	− 0.51	**− 23.58**	18 35 56.60	+ 4 32.51	+ 20.6	1 47 55.37	+ 0.08	69 47 10.9	+ 2.
	30	α Arietis	9	0 43.01	− 0.43	**− 23.49**	15 55 50.40	+ 4 13.26	+ 17.5	2 0 19.06	− 0.02	67 6 42.4	− 0.
	31	Anonymous	5	30 7.32	− 0.60	− 23.52	21 39 55.22	+ 6 26.04	+ 24.3	2 29 43.20	− 4.57	72 53 6.8	+27.
	32	ζ Arietis	9	8 18.80	− 0.50	**− 23.55**	18 13 46.40	+ 3 50.63	+ 20.2	3 7 54.78	+ 0.03	69 24 18.4	− 1.
P. 11	33	Moon I, S.	7	43 48.51	− 0.71	− 24.66	59 41 51.98	+ 3 0.48	+ 1 42.1	20 43 23.14	+65.55	110 52 55.8	. .
	34	ν Cygni	9	53 1.47	+ 0.19	**− 24.67**	358 7 49.30	+ 3 46.27	− 1.9	20 52 37.00	+ 0.05	49 17 54.9	+ 1.
	35	61¹ Cygni	9	1 49.79	+ 0.14	**− 24.63**	0 39 49.88	+ 4 36.37	+ 0.8	21 1 25.27	− 0.04	51 50 48.2	+ 0.
	36	ζ Cygni	9	8 9.02	− 0.01	**− 24.65**	9 5 49.20	+ 3 51.89	+ 9.7	21 7 44.35	+ 0.02	60 16 12.0	+ 0.
	37	ι Pegasi	9	16 51.40	− 0.18	**− 24.70**	19 31 47.75	+ 4 23.25	+ 21.3	21 16 26.56	− 0.02	70 42 53.5	+ 2.
	38	ι Draconis, s. p.	9	20 6.50	− 5.60	− 24.66	300 43 51.52	+ 2 59.95	− 1 40.2	9 19 36.24	− 0.29	351 51 32.5	− 1.
	39	B. A. C. 7504	6	23 46.74	+11.88	− 24.66	312 17 50.82	+ 4 54.06	− 1 5.6	21 23 33.96	+18.04	3 28 0.5	+31.
	40	ε Pegasi	9	38 36.67	− 0.32	**− 24.66**	29 29 49.62	+ 4 11.93	+ 34.0	21 38 11.69	0.00	80 40 56.8	+ 1.
E.	41	12² Canum Venat.	9	50 43.01	+ 0.16	**− 24.84**	359 49 45.42	+ 5 19.10	− 0.1	12 50 18.29	− 0.01	51 1 25.6	− 0.
	42	B. A. C. 4367	9	56 30.46	− 0.26	− 24.88	27 11 48.45	+ 4 22.93	+ 30.8	12 56 5.32	− 2.12	78 23 3.4	−19.
	43	Polaris, s. p.	6	15 25.35	−31.64	− 24.88	307 29 44.08	+ 4 56.08	− 1 17.5	1 14 28.83	− 1.12	358 39 43.9	− 1.
	44	α Virginis	9	19 10.38	− 0.54	**− 24.96**	49 19 52.05	+ 3 58.40	+ 1 9.5	13 18 44.96	+ 0.05	100 31 21.1	− 0.
	45	η Ursæ Maj. (R.)	.	. . . .	. .	. .	190 57 48.18	+ 3 35.54	+ 11.6	. . . .	. .	40 4 45.9	+ 0.
	46	η Ursæ Majoris	.	. . . .	. .	. .	348 53 48.82	+ 4 47.51	− 11.6	. . . .	. .	40 4 45.9	+ 0.
	47	η Bootis	9	49 16.52	− 0.16	**− 24.84**	19 47 52.18	+ 4 50.56	+ 21.5	13 48 51.48	− 0.08	70 59 25.4	+ 0.
	48	α Bootis (R.)	.	. . . .	. .	. .	160 51 47.78	+ 3 59.07	− 20.5	. . . .	. .	70 10 54.9	+ 0.
	49	α Bootis	.	. . . .	. .	. .	18 59 47.10	+ 4 26.60	+ 20.5	. . . .	. .	70 10 55.4	+ 1.
12	50	Sun I, N.	9	11 18.87	− 0.61	− 24.89	56 23 53.90	+ 4 40.97	+ 1 28.6	15 10 53.37	+68.28	107 36 24.6	. .

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
3	30.45	48.5	49.0
4	30.43	43.8	41.2
13	30.42	44.5	40.8
22	30.43	43.0	39.4
26	30.39	41.0	35.8
34	30.21	42.4	41.2
40	30.21	40.6	40.0
43	30.25	41.5	42.5

For summary of the elements of reduction see page 3.

33. One bisection.
3, 9. Four bisections.
26. Five bisections.

ZENITH-POINT CORR.

		″
No. 1 to 3	+	47.82
No. 4 to 32	+	49.59
No. 33 to 40	+	52.56
No. 41 to 50	+	52.01

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
1	− 8.7	+ 9.8	. .	+ 1.
2	− 8.7	− 9.8	0.0	− 18.
33	−47 1.0	− 14 54.3	. .	− 1 1 55.
50	− 7.5	+ 16 11.9	. .	+ 16 4.

TE ND S'R.	Number.		OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
77.					m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	′ ″	″
12	1		Sun II, S.	9	13 35.43	− 0.61	− 24.89	56 55 50.72	+ 5 6.22	+ 1 30.4	15 13 9.93	−68.28	108 8 48.5	. .
	2	μ	Herculis	9	42 4.78	− 0.03	**− 24.85**	11 1 49.72	+ 4 0.87	+ 11.4	17 41 39.84	− 0.02	62 12 23.2	+ 1.8
	3	γ	Draconis (R.)	.	. . .	. .	. .	192 31 47.20	+ 4 41.22	+ 13.0	. . . .	. .	38 29 39.8	− 1.9
	4	γ	Draconis	2	54 9.12	+ 0.49	− 24.91	347 19 49.02	+ 3 45.90	− 13.0	17 53 44.70	− 0.18	38 29 43.1	+ 1.4
	5	δ	Ursæ Minoris	8	11 35.59	+12.15	− 24.91	312 13 49.60	+ 4 15.12	− 1 4.0	18 11 22.83	− 0.18	3 23 21.9	− 2.0
	6	η	Serpentis	9	15 24.39	− 0.43	**− 25.04**	41 43 51.22	+ 4 42.88	+ 52.1	18 14 59.05	+ 0.23	92 55 47.4	+ 1.7
	7		Venus I, S.	9	26 1.22	− 0.72	− 24.92	64 53 51.88	+ 4 23.25	+ 2 4.1	18 25 35.60	+ 0.72	116 6 40.4	. .
	8		Venus, N.	.	. . .	. .	. .	64 53 51.88	+ 4 2.68	+ 2 4.0	. . . .	. .	116 6 19.8	. .
	9	α	Lyræ	9	33 12.00	+ 0.16	**− 24.88**	0 9 48.18	+ 3 29.45	+ 0.2	18 32 47.24	− 0.01	51 19 39.0	+ 0.4
	10	β	Lyræ	9	45 58.33	+ 0.06	**− 24.89**	5 35 48.55	+ 4 20.39	+ 5.8	18 45 33.47	+ 0.01	56 46 35.9	+ 0.5
	11	61¹	Cygni	7	1 49.91	+ 0.18	**− 24.81**	0 39 51.45	+ 4 35.08	+ 0.8	21 1 25.18	+ 0.11	51 50 48.5	+ 1.0
	12	ζ	Cygni	9	8 9.17	+ 0.02	**− 24.85**	9 5 50.00	+ 3 50.78	+ 9.5	21 7 44.28	− 0.03	60 16 11.5	− 0.4
	13	ι	Pegasi	9	16 51.58	− 0.14	**− 24.94**	19 31 46.85	+ 4 24.39	+ 21.0	21 16 26.53	− 0.03	70 42 53.4	+ 1.8
	14	β	Aquarii	9	25 33.74	− 0.47	**− 25.04**	44 53 47.72	+ 5 19.33	+ 58.8	21 25 8.35	+ 0.13	96 6 27.0	+ 1.8
	15		Moon I, S.	9	31 41.74	− 0.60	− 24.92	55 3 47.12	+ 4 31.13	+ 1 24.4	21 31 16.22	+63.48	106 16 3.8	. .
	16		Saturn I. S.	4	3 26.40	− 0.50	− 24.96	47 13 49.02	+ 5 52.26	+ 1 4.3	23 3 0.94	+ 0.78	98 27 6.8	. .
	17		Saturn II, N.	5	3 27.06	− 0.50	− 24.96	47 13 49 02	+ 5 32.28	+ 1 4.3	23 3 2.50	− 0.78	98 26 46.8	. .
	18		Mars I, S.	4	15 13.70	− 0 48	− 24.96	45 19 49.30	+ 4 2.92	+ 1 0.2	23 14 48.26	+ 0.66	96 31 13.6	. .
	19		Mars II, N.	5	15 14.90	− 0.48	− 24.96	45 19 49.30	+ 3 46.93	+ 1 0.2	23 14 49.46	− 0.54	96 30 57.6	. .
	20	λ	Draconis, S. P.	9	24 36.07	− 2.46	− 24.97	288 51 47.18	+ 4 43.19	− 2 51.7	11 24 8.64	+ 0.61	339 59 59.9	+ 0.4
	21	ι	Piscium (R.)	.	. . .	. .	. .	145 59 52.75	+ 5 10.29	− 40.0	. . . .	. .	85 1 58.2	− 0.2
	22	ι	Piscium	7	34 6.60	− 0.34	− 24.97	33 49 51.35	+ 5 6.08	+ 40.0	23 33 41.29	+ 0.02	85 1 58.6	+ 0.2
	23		B. A. C. 139	9	28 50.54	+ 0.88	− 25.00	337 37 48.05	+ 4 27.82	− 24.5	0 28 26.42	− 4.43	28 48 12.6	+36.3
	24		B. A. C. 226	9	43 13.01	+ 0.35	− 25.00	351 43 46.50	+ 3 48.06	− 8.6	0 42 48.36	− 4.31	42 53 47.2	+34.9
	25		B. A. C. 253 (R.)	.	. . .	. .	. .	201 3 46.28	+ 5 49.33	+ 23.2	. . . .	. .	29 56 22.4	+35.4
	26		B. A. C. 253	5	49 46.60	+ 0.82	− 25.00	338 45 50.20	+ 4 37.28	− 23.2	0 49 22.42	− 4.79	29 56 25.5	+35.4
	27		B. A. C. 303	9	58 59.84	− 0.35	− 25.01	33 47 50.20	+ 4 52.63	+ 40.2	0 58 34.48	− 4.16	64 59 44.2	+28.0
	28		B. A. C. 345	9	4 40.16	0.00	− 25.01	8 3 48.30	+ 2 57.00	+ 8.5	1 4 24.15	− 4.30	59 13 15.0	+32.3
	29		Polaris	5	14 23.34	+30.43	− 25.01	310 9 47.20	+ 5 15.85	− 1 10.7	1 14 28.76	− 0.96	1 20 13.5	− 1.3
	30		B. A. C. 450	9	24 51.76	+ 0.98	− 25.02	335 51 46.40	+ 4 12.37	− 26.8	1 24 27.72	− 5.64	27 1 53.2	+33.6
	31		Neptune	9	16 38.07	− 0.28	− 25.04	27 5 49.72	+ 4 31.89	+ 30.9	2 16 12.75	. .	78 17 13.7	. .
	32		Lalande 4803	9	29 50.27	− 0.35	− 25.05	32 29 48.62	+ 4 47.74	+ 38.4	2 29 24.87	− 4.47	83 41 36.0	+26.6
	33	γ²	Ceti	9	37 25.62	− 0.39	**− 25.10**	36 5 48.48	+ 3 40.40	+ 44.0	2 37 0.18	+ 0.04	87 16 34.1	− 0.5
	34		Aglaia	9	50 10.98	− 0.14	− 25.05	16 55 49.15	+ 6 36.34	+ 18.5	2 49 45.79	. .	68 9 5.2	− 1.4
	35	α	Ceti	9	56 20.99	− 0.38	**− 25.08**	35 11 48.38	+ 4 20.21	+ 42.6	2 55 55.55	+ 0.03	86 23 12.4	− 0.7
	36		Alceste	9	59 10.71	− 0.25	− 25.06	24 47 47.32	+ 6 47.58	+ 28.0	2 58 45.40	. .	76 1 24.1	− 2.0
	37	ζ	Arietis	9	8 19.96	− 0.16	**− 24.99**	18 13 48.72	+ 3 50.03	+ 19.9	3 7 54.74	− 0.07	69 24 19.9	+ 0.4
	38		Erato	9	16 54.32	− 0.24	− 25.07	24 11 49.70	+ 6 9.55	+ 27.2	3 16 29.01	. .	75 24 47.6	− 2.3
	39		Polaris, S. P.	4	15 28.62	−36.45	− 25.30	307 29 39.10	+ 5 2.28	− 1 17.5	1 14 26.87	− 2.61	358 39 45.1	− 0.3
	40	η	Ursæ Majoris	9	43 7.53	+ 0.53	− 25.31	348 53 49.02	+ 4 46.97	− 11.6	13 42 42.75	− 0.02	40 4 45.6	− 0.3
	41	α	Draconis	4	1 27.26	+ 1.35	− 25.31	333 51 48.78	+ 4 55.40	− 29.0	14 1 3.30	− 0.07	25 2 36.4	− 1.3
	42	α	Bootis (R.)	.	. . .	. .	. .	160 51 38.75	+ 4 5.78	− 20.4	. . . .	. .	70 10 57.1	+ 2.7
	43	α	Bootis	.	. . .	. .	. .	18 59 51.10	+ 4 22.49	+ 20.4	. . . .	. .	70 10 55.2	+ 0.8
	44	θ	Bootis	7	21 25 83	+ 0.67	− 25.32	346 23 56.10	+ 5 9.71	− 14.2	14 21 1.18	+ 0.07	37 35 12.8	+ 1.5
13	45		Sun I, S.	9	15 24.54	− 0.68	− 25.34	57 11 51.18	+ 4 56.67	+ 1 30.6	15 14 58.52	+68.46	108 24 39.6	. .
	46		Sun II, N.	9	17 41.47	− 0.68	− 25.31	56 39 58.40	+ 4 28.90	+ 1 28.7	15 17 15.45	−68.47	107 52 17.2	. .
	47	η	Herculis	9	39 6.44	+ 0.27	**− 25.32**	359 31 53.20	+ 4 29.40	− 0.3	16 38 41.34	+ 0.05	50 50 43.5	+ 3.8
	48	α¹	Herculis	9	9 29.48	− 0.20	**− 25.34**	24 16 . .	. .	. .	17 9 3.90	− 0.02	. . . .	. .
	49	α	Ophiuchi	9	29 40.71	− 0.22	**− 25.29**	26 9 50.22	+ 4 21.52	+ 28.6	17 29 15.10	− 0.06	77 21 1.5	+ 2.8
	50	μ	Herculis	9	42 5.17	+ 0.04	**− 25.32**	11 1 48.68	+ 4 3.62	+ 11.4	17 41 39.82	+ 0.03	62 12 24.9	+ 3.3

Barom.	At. Ther.	Ex Ther.
in.	°	°
30.22	46.3	49.3
30 22	50.5	53.5
30.18	51.2	53.5
30.17	49.0	48.5
30.16	42.5	38.5
30.15	39.5	35.5
30.30	41.2	43.0
30.29	48.5	54.4

For summary of the elements of reduction see page 3.

29. Three bisections.
2, 9, 50. Four bisections.

ZENITH-POINT CORR.

		″
No. 1 to 10	+	52.01
No. 11 to 38	+	51.56
No. 39 to 50	+	50.90

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 7.5	− 16 11.9	. .	− 16 19.4
7	− 9.0	− 10.3	0.0	− 19.3
8	− 9.0	+ 10.3	. .	+ 1.3
15	−44 25.6	− 14 50.0	. .	− 59 15.6
16	− 0.7	− 10.0	. .	− 10.7
17	− 0.7	+ 10.0	. .	+ 9.3
18	− 9.2	− 8.1	. .	− 17.3
19	− 9.2	+ 8.1	− 0.2	− 1.3
31	− 0.1	. .	. .	− 0.1
45	− 7.5	− 16 11.2	. .	− 16 18.7
46	− 7.5	+ 16 11.2	. .	+ 16 3.7

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLA DISTANCE.
					Inst.	Clock.		Instrument.	Refraction.			
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″
Nov. 13	1	γ Draconis (R.) .	.	. . .	. .	. .	192 31 49.70	+ 4 38.60	+ 13.0	. . . .	. .	38 29 39.9
F.	2	γ Draconis . .	2	54 9.41	+ 0.67	− 25.40	347 19 48.45	+ 3 46.13	− 13.0	17 53 44.68	− 0.18	38 29 42.8
	3	γ² Sagittarii . .	9	58 23.57	− 0.85	− **25.60**	69 11 49.10	+ 4 53.11	+ 2 31.9	17 57 57.32	+ 0.19	120 25 35.3
	4	δ Ursæ Minoris .	5	11 32.72	+14.70	− 25.40	312 13 48.78	+ 4 16.79	− 1 3.5	18 11 22.02	− 0.67	3 23 23.3
	5	η Serpentis . .	9	15 24.86	− 0.44	− **25.51**	41 43 49.02	+ 4 44.23	+ 51.8	18 14 59.02	+ 0.21	92 55 46.3
	6	ι Aquilæ . . .	7	28 59.19	− 0.52	− **25.45**	47 7 55.70	+ 4 27.88	+ 1 2.4	18 28 33.26	+ 0.12	98 19 47.2
	7	Venus I, N. .	7	31 4.47	− 0.79	− 25.41	64 51 51 12	+ 3 37.46	+ 2 3.1	18 30 38.27	+ 0.73	116 3 52.9
	8	Venus, S. . .	.	. . .	. .	. .	64 51 51.12	+ 3 59.75	+ 2 3.1	. . . .	. .	116 4 15.2
	9	α Lyræ . . .	9	33 12.32	+ 0.27	− **25.32**	0 9 58.48	+ 3 19.95	+ 0.2	18 22 47.18	− 0.06	51 19 39.8
	10	O. Arg. N. 23109	9	52 47.19	+ 0.44	− 25.38	350 39 48.65	+ 8 24.84	− 9.6	21 52 22.25	− 2.00	41 54 25.1
	11	θ Aquarii . . .	9	10 50.14	− 0.58	− **25.50**	47 11 50.25	+ 4 11.12	+ 1 4.0	22 10 24.18	+ 0.14	98 23 26.6
	12	Moon I, S. . .	9	17 3 32	− 0.62	− 25.38	49 53 53.30	+ 3 39.76	+ 1 10.4	22 16 37.32	+62.04	101 5 4.7
	13	λ Aquarii . . .	9	46 41.51	− 0.58	− **25.41**	47 1 48.18	+ 4 29.17	+ 1 3.9	22 46 15.54	+ 0.12	98 13 42.5
	14	Weisse 966 . .	9	48 7.76	− 0.65	− 25.39	51 37 52.72	+ 4 47.31	+ 1 15.2	22 47 41.72	− 3.77	102 50 16.4
	15	Weisse 1047 .	9	52 9.48	− 0.64	− 25.39	50 35 55.72	+ 3 34.60	+ 1 12.4	22 51 43.45	− 3.77	101 47 3.9
	16	Weisse 1156 .	9	56 35.49	− 0.64	− 25.39	50 43 54.68	+ 3 48.32	+ 1 12 8	22 56 9.46	− 3.79	101 55 17.0
	17	Weisse 1204 .	9	58 32.86	− 0.65	− 25.39	51 37 51.58	+ 4 41.35	+ 1 15.2	22 58 6.82	− 3.82	102 50 9.3
	18	Saturn I, N. .	4	3 25.40	− 0.59	− 25.39	47 13 51.02	+ 5 29.52	+ 1 4.5	23 2 59.42	+ 0.68	98 26 46.2
	19	Saturn II, S. .	5	3 26.76	− 0.59	− 25.39	47 13 51.02	+ 5 47.15	+ 1 4.5	23 3 0.78	− 0.68	98 27 3.9
	20	Weisse 123 . .	9	8 45.49	− 0.63	− 25.39	50 9 59.78	+ 3 33.05	+ 1 11.4	23 8 19.47	− 3.84	101 21 5.4
	21	Lalande 45504 .	7	9 25.82	− 0.64	− 25.39	51 1 52.88	+ 4 18.10	+ 1 13.7	23 8 59.79	− 3.85	102 13 45.9
	22	Weisse 265 . .	7	14 58.54	− 0.63	− 25.39	49 59 55.75	+ 4 33.14	+ 1 11.1	23 14 32.52	− 3.86	101 12 1.2
	23	Mars I, N. . .	9	16 38.57	− 0.56	− 25.39	45 5 59 78	+ 5 21.05	+ 59.9	23 16 12.62	+ 0.49	96 18 41.9
	24	Weisse 571 . .	8	29 35.77	− 0.63	− 25.40	50 1 50.62	+ 4 22.06	+ 1 11.2	23 29 9.74	− 3.92	101 13 45.1
	25	Weisse 586 . .	7	30 9.38	− 0.60	− 25.40	48 15 51.75	+ 3 0.47	+ 1 6.9	23 29 43.38	− 3.90	99 26 20.3
	26	Weisse 629 . .	9	32 21.38	− 0.60	− 25.40	48 7 57.08	+ 2 44.14	+ 1 6.6	23 31 55.38	− 3.91	99 18 9.0
	27	ω Piscium . . .	9	53 29.42	− 0.39	− **25.43**	32 37 51.58	+ 3 45.06	+ 38.2	23 53 3.63	+ 0.03	83 48 36.0
	28	α Andromedæ .	9	2 31.24	− 0.05	− **25.26**	10 23 51.80	+ 4 22.63	+ 11.0	0 2 5.59	− 0.11	61 34 46.6
	29	γ Pegasi . . .	9	7 23.72	− 0.27	− **25.38**	24 17 49.98	+ 4 53.37	+ 27.1	0 6 58.06	− 0.01	75 29 31.7
	30	B. A. C. 226. .	9	43 13.28	+ 0.37	− 25.41	351 43 48.22	+ 3 47.69	− 8.6	0 42 48.24	− 4.30	42 53 48.5
	31	Polaris . . .	5	14 17.42	+34.52	− 25.42	310 9 58.60	+ 5 6.50	− 1 10.7	1 14 26.52	− 2.72	1 20 15.6
	32	Anonymous .	9	29 29.00	− 0.19	− 25.42	18 9 49.68	+ 6 37 78	+ 19.8	1 29 3.39	− 4.37	69 23 8.5
	33	Brunhild . .	7	29 57.93	− 0.19	− 25.42	18 9 49.68	+ 3 28.80	+ 19.7	1 29 32.32	. .	69 19 59.4
	34	Neptune. . .	7	16 32.37	− 0.33	− 25.43	27 5 51.05	+ 5 2.23	+ 30.9	2 16 6.61	. .	78 17 45.4
	35	Aglaia . . .	9	49 16.37	− 0.18	− 25.43	16 59 50.78	+ 5 46.54	+ 18.6	2 48 50.76	. .	68 12 17.1
	36	Alceste . . .	9	58 16.64	− 0.30	− 25.43	24 51 52.65	+ 7 17.09	+ 28.1	2 57 50.91	. .	76 5 59.0
	37	Erato. . . .	9	16 4.53	− 0.30	− 25.44	24 13 50.90	+ 7 7.34	+ 27.4	3 15 38.79	. .	75 27 46.8
	38	δ Persei (R.) .	.	. . .	. .	. .	188 25 50.78	+ 4 16.58	+ 9.0	. . . .	. .	42 36 4.8
	39	δ Persei . .	.	. . .	. .	. .	351 25 55.95	+ 3 58.08	− 9.0	. . . .	. .	42 36 6.2
	40	γ¹ Eridani . .	9	52 48.00	− 0.70	− **25.51**	52 39 56.95	+ 3 36.94	+ 1 19.4	3 52 21.86	+ 0.10	103 51 14.5
	41	Thetis . . .	9	56 43.42	− 0.34	− 25.44	26 39 56.52	+ 5 11.12	+ 30.5	3 56 17.64	. .	77 51 59.3
	42	γ Tauri . . .	9	13 18.16	− 0.29	− **25.38**	23 27 51.38	+ 5 16.25	+ 26.4	4 12 52.42	+ 0.05	74 39 55.2
E. 15	43	12² Canum Venat. .	9	50 44.18	+ 0.05	− **25.79**	359 49 49.08	+ 5 16.86	− 0.1	12 50 18.38	− 0.03	51 1 27.0
	44	Polaris, S. P. .	8	15 21.44	−27.97	− 25.86	307 49 42.30	+ 4 56.01	− 1 14.5	1 14 27.61	− 0.50	358 39 45.0
	45	α Virginis . . .	8	19 11.40	− 0.49	− **25.94**	49 19 47.02	+ 4 5.90	+ 1 6.9	13 18 45.05	+ 0.05	100 31 21.0
	46	η Ursæ Maj. (R.) .	.	. . .	. .	. .	190 57 42.10	+ 3 41.66	+ 11.2	. . . .	. .	40 4 46.2
	47	η Ursæ Majoris .	.	. . .	. .	. .	348 53 48.18	+ 4 48.94	− 11.2	. . . .	. .	40 4 47.1
	48	η Bootis . . .	9	49 17.66	− 0.21	− **25.86**	19 47 45.85	+ 4 59.15	+ 20.7	13 48 51.59	− 0.04	70 59 26.9
	49	α Bootis (R.) .	.	. . .	. .	. .	160 51 43.22	+ 4 0.42	− 19.8	. . . .	. .	70 10 57.3
	50	α Bootis . . .	.	. . .	. .	. .	18 59 41.38	+ 4 34.83	+ 19.8	. . . .	. .	70 10 57.3

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
5	30.29	56.5	58.1
9	30.29	56.4	57.9
10	30.31	49.6	48.1
26	30.31	46.5	43.6
31	30.32	45.0	41.6
35	30.31	41.4	38.0
42	30.31	39.2	35.8
44	30.17	60.0	60.0

For summary of the elements of reduction see page 3.

32, 33, 40. One bisection.
12, 41. Three bisections.
28, 29, 48. Four bisections.
4, 31. Five bisections.

ZENITH-POINT CORR.

No. 1 to 9 + 50.″90
No. 10 to 42 + 51.82
No. 43 to 50 + 52.83

No.	Parallax.	Semi-diam.	Defective Illumination.	
	′ ″	′ ″	′ ″	
7	− 9.1	+ 11.2	− 0.1	+
8	− 9.1	− 11.2	. .	−
12	−41 22.2	− 14 48.6	. .	−
18	− 0.7	+ 8.9	. .	+
19	− 0.7	− 8.8	. .	−
23	− 9.1	+ 7.4	. .	−
34	− 0.1	. .	. .	−

TE D 'R.	Number.	OBJECT.	Threads.	MEAN THREAD	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction.
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
r. 16	1	Sun I, S. . .	5	27 45.54	− 0.56	− 25.91	57 55 47.65	+ 7 0.50	+ 1 31.0	15 27 19.07	+68.74	109 10 40.3	. .
:.	2	Sun II, N. .	9	30 3.02	− 0.56	− 25.91	57 25 50.75	+ 4 34.37	+ 1 29.1	15 29 36.55	−68.74	108 38 15.4	. .
	3	α Ophiuchi . .	7	29 41.41	− 0.26	− **25.96**	26 9 44.92	+ 4 28.65	+ 27.9	17 29 15.19	+ 0.04	77 21 2.7	+ 3.5
	4	ε Pegasi . . .	6	38 37.84	− 0.23	− **25.97**	29 29 45.70	+ 4 17.64	+ 32.8	21 38 11.60	− 0.04	80 40 57.3	+ 1.5
	5	μ Capricorni . .	9	47 5.28	− 0.48	− **25.98**	52 55 42.95	+ 4 14.26	+ 1 16.6	21 46 38.79	− 0.03	104 7 35.0	+ 2.4
	6	α Aquarii . . .	9	59 57.66	− 0.35	− **26.08**	39 43 44.90	+ 3 46.91	+ 48.2	21 59 31.30	+ 0.09	99 54 41.2	+ 0.4
	7	Saturn I, S. . .	4	3 23.48	− 0.44	− 26.00	47 13 44.25	+ 5 34.10	+ 1 3.0	23 2 57.04	+ 0.13	98 26 42.6	. .
	8	Saturn II, N. .	5	3 24.74	− 0.44	− 26.00	47 13 44.25	+ 5 16.82	+ 1 3.0	23 2 58.30	− 0.63	98 26 25.3	. .
	9	ο Cephei (R.) . .	.	. . .	. .	. .	208 27 42.00	+ 5 4.63	+ 31.6	. . . . .	. .	22 33 3.0	− 1.3
	10	ο Cephei . . .	2	14 2.14	+ 1.22	− 26.00	331 23 42.05	+ 3 32.75	− 31.6	23 13 37.36	− 0.17	22 33 4.4	+ 0.1
	11	Mars I, S. . .	9	21 0.83	− 0.41	− 26.00	44 29 49.72	+ 4 17.21	+ 57.3	23 20 34.42	+ 0.48	95 41 25.4	. .
	12	Mars N. . . .	.	. . .	. .	. .	44 29 49.72	+ 4 1.82	+ 57.2	. . . . .	. .	95 41 29.9	. .
	13	ι Piscium (R.) . .	.	. . .	. .	. .	145 59 47.88	+ 5 12.65	− 39.1	. . . . .	. .	85 1 59.8	+ 1.3
	14	ι Piscium . . .	.	. . .	. .	. .	33 49 42.22	+ 5 15.96	+ 39.1	. . . . .	. .	85 1 58.5	0.0
	15	Anonymous .	9	42 0.82	− 0.42	− 25.99	44 25 47.12	+ 3 18.73	+ 57.2	23 41 34.41	− 3.87	95 36 24.2	+23.0
	16	O. Arg. N. 26144	9	48 8.10	+ 1.50	− 25.99	327 59 49.28	+ 5 25.29	− 36.3	23 47 43.61	− 3.54	19 10 59.5	+38.2
	17	Durch. 70°, 1340	9	54 57.52	+ 1.50	− 25.99	327 59 49.28	+ 2 55.12	− 36.4	23 54 33.03	− 3.76	19 8 29.2	+38.2
	18	B. A. C. 8359 .	9	58 23.13	+ 0.80	− 25.99	337 13 45.32	+ 3 31.95	− 24.4	23 57 57.94	− 3.73	28 23 14.1	+37.7
	19	Moon I, S. . .	9	28 49.62	− 0.30	− 25.99	32 41 44.62	+ 5 24.37	+ 37.6	0 28 23.33	+62.42	83 54 7.8	. .
	20	B. A. C. 226. .	9	43 13.81	+ 0.30	− 25.99	351 43 41.82	+ 3 53.66	− 8.4	0 42 48.12	− 4.27	42 53 48.3	+35.6
	21	Anonymous .	9	52 2.52	− 0.35	− 25.98	37 9 45.92	+ 3 58.81	+ 44.5	0 51 36.19	− 4.13	88 20 50.4	+27.0
	22	Polaris . . .	4	14 25.60	+27.63	− 25.98	310 9 47.80	+ 5 16.93	− 1 9.2	1 14 27.25	− 0.65	1 20 16.7	+ 3.2
	23	Brunhild . .	5	28 11.66	− 0.14	− 25.98	18 25 44.90	+ 4 52.98	+ 19.6	1 27 45.54	. .	69 37 18.7	. .
	24	ξ¹ Ceti	9	6 59.67	− 0.28	− **26.02**	30 31 45.52	+ 4 43.39	+ 34.8	2 6 33.42	+ 0.13	81 43 24.9	+ 0.3
	25	Neptune. . .	9	16 14.46	− 0.24	− 25.97	27 7 50.20	+ 4 34.59	+ 30.3	2 15 48.25	. .	78 19 16.3	. .
	26	ξ² Ceti	9	22 8.00	− 0.28	− 25.97	30 53 49.60	+ 4 20.04	+ 35.3	2 21 41.75	− 4.48	82 5 6.1	+26.9
	27	B. A. C. 777. .	9	26 55.48	+ 1.63	− 25.97	326 31 47.05	+ 5 20.26	− 38.8	2 26 31.14	− 8.60	17 42 49.7	+29.2
	28	Lalande 4803 .	9	29 51.11	− 0.30	− 25.97	32 29 51.48	+ 4 46.49	+ 37.6	2 29 24.84	− 4.49	83 41 36.8	+26.5
	29	γ² Ceti	9	37 26.50	− 0.34	− **26.01**	36 5 51.42	+ 3 39.97	+ 43.1	2 37 0.19	+ 0.03	87 16 35.7	+ 0.9
	30	B. A. C. 863 .	9	42 15.72	+ 0.54	− 25.97	343 25 51.20	+ 4 37.39	− 17.5	2 41 50.29	− 6.17	34 36 32.3	+28.1
	31	Aglaia . . .	9	46 35.40	− 0.13	− 25.97	17 9 49.22	+ 5 6.89	+ 18.3	2 46 9.30	. .	68 21 35.6	− 1.4
	32	Alceste . . .	6	55 37.11	− 0.23	− 25.97	25 6 . .	. . .	. .	2 55 10.91	. .	. . . .	. .
	33	ζ Arietis . . .	9	8 20.87	− 0.14	− **25.88**	18 13 46.08	+ 3 53.48	+ 19.5	3 7 54.76	− 0.09	69 24 20.3	+ 1.0
	34	Erato . . .	9	13 36.30	− 0.21	− 25.96	24 23 45.72	+ 5 48.54	+ 26.9	3 13 10.13	. .	75 36 22.4	− 2.3
F.	35	Polaris, S. P. .	4	15 18.65	−26.09	− 26.06	307 29 48.90	+ 4 48.71	− 1 16.0	1 14 26.50	− 1.21	358 39 42.8	− 3.8
	36	α Bootis . . .	9	10 31.00	− 0.16	− **26.02**	18 59 46.22	+ 4 25.97	+ 20.5	14 10 4.79	− 0.01	70 10 53.9	− 1.5
17	37	κ Ophiuchi . .	2	52 18.85	− 0.24	− **26.12**	29 13 43.62	+ 5 26.21	+ 32.0	16 51 52.38	+ 0.16	80 26 3.0	+ 0.4
	38	α¹ Herculis. . .	9	9 30.10	− 0.18	− **25.98**	24 15 48.28	+ 5 34.41	+ 25.8	17 9 3.89	− 0.03	75 28 9.7	0.0
	39	α Ophiuchi . .	9	29 41.42	− 0.20	− **26.03**	26 9 46.38	+ 4 21.75	+ 28.0	17 29 15.19	+ 0.04	77 20 57.3	− 2.0
	40	μ Herculis. . .	7	42 5.93	− 0.03	− **26.03**	11 1 43.85	+ 4 5.50	+ 11.2	17 41 39.87	+ 0.04	62 12 21.8	− 0.6
	41	λ Aquarii . . .	6	46 42.06	− 0.41	− **26.17**	47 1 48.55	+ 4 32.20	+ 1 2.0	22 46 15.58	+ 0.20	98 13 44.0	+ 3.2
	42	Weisse 1156 .	9	56 35.99	− 0.44	− 26.07	50 43 47.90	+ 3 57.85	+ 1 10.6	22 56 9.48	− 3.75	101 55 17.6	+18.5
	43	Weisse 1232 .	9	59 58.30	− 0.44	− 26.08	49 53 45.55	+ 4 33.06	+ 1 8.6	22 59 31.78	− 3.75	101 5 48.4	+19.0
	44	Weisse 1249 .	9	1 2.07	− 0.46	− 26.08	52 11 46.88	+ 3 48.26	+ 1 14.3	23 0 35.51	− 3.79	103 23 10.6	+18.2
	45	Weisse 49 . .	9	5 34.40	− 0.44	− 26.08	49 57 45.28	+ 5 0.27	+ 1 8.8	23 5 7.88	− 3.78	101 10 15.6	+19.3
	46	Weisse 123 . .	9	8 45.98	− 0.44	− 26.08	50 9 48.88	+ 3 49.02	+ 1 9.2	23 8 19.46	− 3.79	101 21 8.3	+19.4
	47	Lalande 45504 .	6	9 26.45	− 0.45	− 26.08	51 1 48.45	+ 4 27.32	+ 1 11.4	23 8 59.92	− 3.81	102 13 48.4	+19.1
	48	Weisse 265 . .	9	14 59.12	− 0.44	− 26.09	49 59 45.65	+ 4 46.61	+ 1 8.9	23 14 32.59	− 3.82	101 12 2.4	+19.8
	49	Weisse 309 . .	7	17 8.09	− 0.44	− 26.09	50 15 46.18	+ 3 16.61	+ 1 9.5	23 16 41.56	− 3.83	101 26 33.5	+19.8
	50	Weisse 571 . .	8	29 36.28	− 0.44	− 26.10	50 1 49.85	+ 4 27.22	+ 1 9.0	23 29 9.74	− 3.88	101 13 47.3	+20.6

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.15	63.2	64.4
30.13	56.5	56.3
30.12	50.0	45.2
30.09	49.5	49.0
30.04	60.2	62.6
30.04	63.4	62.3
30.00	57.2	55.1

For summary of the elements of reduction see page 3.

22. Three bisections.
35, 36. Four bisections.
19. Five bisections.

ZENITH-POINT CORR.

		″
No. 1 to 3	+	52.83
No. 4 to 34	+	52.91
No. 35 to 40	+	50.21
No. 41 to 50	+	54.44

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 7.6	− 16 12.4	. .	− 16 20.0
2	− 7.5	+ 16 12.4	. .	+ 16 4.9
7	− 0.7	− 8.6	. .	− 9.3
8	− 0.7	+ 8.7	. .	+ 8.0
11	− 8.7	− 7.9	. .	− 16.6
12	− 8.7	+ 7.9	− 0.3	− 1.1
19	−29 36.8	− 15 1.5	. .	− 44 38.3
25	− 0.1	. .	. .	− 0.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Nov. 17	1	Weisse 586. .	7	30 9.87	− 0.42	− 26.10	48 15 48.55	+ 3 8.64	+ 1 4.8	23 29 43.35	− 3.86	99 26 23.2	+21
F.	2	ι Piscium . . .	9	34 7.63	− 0.28	− **26.16**	33 49 46.68	+ 5 14.47	+ 38.8	23 33 41.25	+ 0.03	85 2 1.2	+ 2
	3	B. A. C. 8359 .	9	58 23.26	+ 0.77	− 26.12	337 13 47.75	+ 3 29.13	− 24.2	23 57 57.91	− 3.70	28 23 13.9	+37
	4	α Andromedæ .	9	2 31.73	− 0.03	− **26 01**	10 23 47.62	+ 4 28.10	+ 10.7	0 2 5.58	− 0.08	61 34 47.6	+ 1
	5	γ Pegasi . . .	9	7 24.31	− 0.19	− **26.07**	24 17 48.50	+ 4 57.79	+ 26.2	0 6 58.00	− 0.04	75 29 33.7	+ 2
	6	B A. C. 69 . .	9	15 18.43	− 0.77	− 26.13	78 39 52.45	+ 4 8.10	+ 4 42.3	0 14 51.53	− 4.54	129 55 4.1	+14
	7	Lacaille 61 . .	9	17 12.23	− 0.77	− 26.13	78 39 52.45	+ 5 30.39	+ 4 43.0	0 16 45.33	− 4.55	129 56 27.0	+14
	8	Lacaille 81 . .	9	19 48.56	− 0.77	− 26.13	78 39 52.45	+ 5 12 56	+ 4 43.0	0 19 21.66	− 4.55	129 56 9.2	+14
	9	κ Draconis, s. P. .	9	28 43.22	− 2.22	− 26.14	289 19 48.48	+ 3 59.75	− 2 42.9	12 28 14.86	− 0.23	340 27 26.5	+ 3
	10	ε Piscium . . .	9	57 4.19	− 0.26	− **26.16**	31 33 48.02	+ 5 7.98	+ 35.7	0 56 37.77	− 0.01	82 45 52.9	+ 0
	11	Polaris . . .	7	14 26.14	+26.38	− 26.17	310 9 47.15	+ 5 14.76	− 1 8.4	1 14 26.35	− 1.17	1 20 14.7	+ 1.
	12	Moon I, S. . .	6	15 12.66	− 0.22	− 26.17	27 1 44.92	+ 4 30.56	+ 29.7	1 14 46.27	+64.19	78 13 6.4	.
	13	α Arietis . . .	9	0 45.44	− 0.11	− **26.20**	15 55 42.85	+ 4 24.08	+ 16.7	2 0 19.13	+ 0.01	67 6 44.8	+ 2.
P. 18	14	Polaris, s. P. . .	6	15 28.93	−36.44	− 26.31	307 30 . .	. . .	. .	1 14 26.18	− 0.82	. . . .	.
	15	ι Bootis . . .	9	10 31.42	− 0.25	− **26.31**	18 59 50.52	+ 4 25.47	+ 20.9	14 10 4.86	+ 0.02	70 10 58.1	+ 2.
	16	ρ Bootis . . .	9	26 59.63	− 0.04	− 26.31	7 53 53.88	+ 5 14.68	+ 8.4	14 26 33.28	− 1.52	59 5 38.2	−21.
	17	ε Bootis . . .	6	40 4.86	− 0.11	− **26.26**	11 13 50.58	+ 4 18.66	+ 12.0	14 39 38.44	− 0.04	62 24 42.4	+ 0.
	18	β Bootis . . .	9	57 45.95	+ 0.18	− **26.37**	357 55 50.48	+ 5 35.28	− 2.1	14 57 19.82	+ 0.09	49 7 44.9	+ 0.
	19	γ^2 Ursæ Minoris .	5	21 17.20	+ 2.16	− 26.31	326 33 53.18	+ 4 28.13	− 39.5	15 20 53.05	+ 0.30	17 44 3.0	+ 0.
19	20	ζ Ursæ Minoris .	5	48 44.86	+ 3.54	− 26 32	320 39 52.15	+ 4 35.04	− 48.9	15 48 22.08	+ 0.30	11 49 59.5	+ 1.
	21	ε Ursæ Minoris .	5	58 44 25	+ 5.75	− 26.32	316 35 50.70	+ 4 39.46	− 56.2	16 58 23.68	+ 0.75	7 45 55.2	+ 0.
	22	δ Ursæ Minoris .	4	11 34.30	+14 11	− 26.33	312 14 . .	. . .	. .	18 11 22.08	+ 1.10	. . . .	.
	23	η Serpentis . .	9	15 25.86	− 0.56	− **26.42**	41 43 51.38	+ 4 42.46	+ 53.1	18 14 58.97	+ 0.19	92 55 48.1	+ 1.
	24	α Lyræ	9	33 13.32	+ 0.15	− **26.28**	0 9 49.95	+ 3 29.65	+ 0.2	18 32 47.14	− 0.02	51 19 41.0	+ 1.
	25	51 Cephei, s. P. .	5	43 54.08	−18.60	− 26.33	306 4 . .	. . .	. .	6 43 9.15	+ 0.17	. . . .	. .
	26	β Lyræ	7	45 59.66	+ 0.03	− **26 28**	5 35 49.65	+ 4 19.11	+ 5.9	18 45 33.36	− 0.01	56 46 35.9	− 0.
	27	ζ Aquilæ . . .	9	0 13.96	− 0.32	− **26.34**	25 8 . .	. . .	. .	18 59 47.31	+ 0.12	. . . .	. .
	28	Venus I, S. . .	5	0 59 44	− 0 91	− 26.33	64 21 52.10	+ 4 47.55	+ 2 3.8	19 0 32.20	+ 0.76	115 35 4.6	. .
	29	Venus N. . .	.	. .	. .	. .	64 21 52.10	+ 4 28.83	+ 2 3.8	. . . .	. .	115 34 45.9	. .
	30	Saturn I, N. .	4	3 25.30	− 0 69	− 26.31	47 13 52.72	+ 4 26.05	+ 1 5.5	23 2 58.30	+ 0.62	98 25 45.5	. .
	31	Saturn II, S. .	5	3 26.54	− 0.69	− 26.31	47 13 52.72	+ 4 42.79	+ 1 5.3	23 2 59.54	− 0.62	98 26 2.0	. .
	32	ο Cephei . . .	5	14 2.49	+ 1.39	− 26.31	331 23 50.50	+ 3 24.04	− 32.9	23 13 37.57	+ 0.17	22 33 2.8	− 1.
	33	θ Piscium . . .	9	22 14.19	− 0.50	− **26.34**	33 5 51.55	+ 4 28.81	+ 39.6	23 21 47.38	+ 0.08	84 17 21.2	+ 1.
	34	Mars I, S. . .	1	25 35.33	− 0 64	− 26.31	43 51 48.18	+ 3 49.67	+ 58.2	23 25 8.38	+ 0.51	95 2 57.2	. .
	35	Mars II, N . .	5	25 36 26	− 0.64	− 26.31	43 51 48.18	+ 3 35.20	+ 58.3	23 25 9.31	− 0.42	95 2 42.9	. .
	36	ι Piscium . . .	9	34 7.99	− 0.51	− **26.31**	33 49 53.15	+ 5 3 95	+ 40.7	23 33 41.17	− 0.03	85 1 59.0	+ 0.
	37	Anonymous .	9	42 1 33	− 0.66	− 26.31	44 25 52.95	+ 3 11.25	+ 59.5	23 41 34.36	− 3.85	95 36 24.9	+22.
	38	Anonymous .	9	43 48.99	− 0.77	− 26.31	51 49 52.52	+ 3 52.23	+ 1 17.2	23 43 21.91	− 3.95	103 1 23.2	+20.
	39	Groom. 4163 .	5	49 17.44	+ 2.19	− 26 31	325 5 52 78	+ 4 16.64	− 42.2	23 48 53.32	− 0.17	16 15 48.4	− 0.
	40	ω Piscium . . .	9	53 30.29	− 0.50	− **26.24**	32 37 52.45	+ 3 42.89	+ 38.9	23 53 3.48	− 0.07	83 48 35.4	− 0.
	41	α Andromedæ .	9	2 32.12	− 0.15	− **26.30**	10 23 48.90	+ 4 24.76	+ 11.2	0 2 5.66	+ 0.02	61 34 46.1	+ 0.
	42	4 Draconis, s. P. .	5	6 57.32	− 4.53	− 26.31	297 9 49.05	+ 3 10.43	− 1 57 5	12 6 26.48	− 0.68	348 17 23.2	+ 2.
	43	B. A. C. 4165, s. P	5	15 3.45	−29.39	− 26.31	307 13 46.62	+ 3 28.21	− 1 19.6	12 14 7.75	+ 8.25	358 22 16.4	+37.
	44	12 Ceti	9	24 16.72	− 0.64	− 26.31	43 25 52.48	+ 4 38.26	+ 57 6	0 23 49.77	− 4.02	94 37 49.5	+24.
	45	κ Draconis, s. P. .	5	28 41.37	− 2.88	− 26.31	289 19 48.82	+ 4 6.27	− 2 51.1	12 28 15.18	− 0.03	340 27 25.2	+ 2.
	46	β Ceti	9	37 56.28	− 0.85	− **26.34**	57 27 53.20	+ 3 32.41	+ 1 35.2	0 37 29.12	+ 0.09	108 39 22.0	+ 0.
	47	Weisse (2) 1062 .	8	43 0.46	+ 0.11	− 26.31	358 23 52.08	+ 4 32.83	− 1.6	0 42 34.26	− 4.16	49 34 44.5	+35.
	48	B. A. C. 227 .	9	43 32.53	+ 0.11	− 26.31	358 23 52.08	+ 4 41.61	− 1.6	0 43 6.33	− 4.16	49 34 53.3	+35.
	49	32^1 Camelop, s. P. .	5	48 37.05	− 8.42	− 26.31	302 55 51.92	+ 3 57.21	− 1 33.4	12 48 2.32	+ 3.53	354 4 37.0	+36.
	50	32^2 Camelop., s. P. .	5	48 44.69	− 8.42	− 26.31	302 55 51.92	+ 3 38.91	− 1 33.4	12 48 9.96	− 0.99	354 4 18.6	+ 3.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	30.00	56.0	54.5
5	29.98	55.8	53.8
8	29.99	55.6	53.0
13	29.98	53.5	50.8
15	30.39	40.2	39.4
19	30 37	41.7	41.8
20	30.36	42.7	43.1
21	30.35	44.7	44.6
23	30.36	46.3	46.2
29	30.35	45.7	45.6
30	30.36	38.8	37.5
43	30.37	37.4	36.0

For summary of the elements of reduction see page 3.

28, 29. One bisection.
12. Three bisections.
15, 19, 20, 24, 32, 39, 42, 45. Four bisections.
43. Five bisections.

ZENITH-POINT CORR.

No. 1 to 13 + 54″.44
No. 15 to 29 + 54.34
No. 30 to 50 + 53.43

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	″	′ ″
12	−25 7.3	− 15 10.1	. .	− 40 17.
28	− 9.5	− 9.4	. .	− 18.
29	− 9.5	+ 9.4	− 0.1	− 0.
30	− 0.7	+ 8.2	. .	+ 7.
31	− 0.7	− 8.3	. .	− 9.
34	− 8.4	− 7.3	. .	− 15.
35	− 8.4	+ 7.3	− 0.3	− 1.

TE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION,	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
77.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
v. 19	1	ε Piscium . .	9	57 4.56	− 0.47	**− 26.33**	31 33 51.30	+ 5 2.51	+ 37.5	0 56 37.78	+ 0.01	82 45 52.5	+ 0.2
P.	2	β Andromedæ .	9	3 21.59	− 0.01	− 26.31	3 51 49.35	+ 3 7.48	+ 4.2	1 2 55.27	− 4.31	55 1 22.2	+33.8
	3	Polaris . . .	5	14 21.12	+34.19	− 26.31	310 9 49.80	+ 5 14.18	− 1 11.8	1 14 29.00	+ 2.16	1 20 13.4	+ 0.4
	4	η Piscium (R.). .	.	. . .	. .	. .	155 45 50.70	+ 4 6.95	− 27.3	. . . .	. .	75 16 50.9	+ 1.8
	5	η Piscium . . .	.	. . .	. .	. .	24 5 51.52	+ 4 11.10	+ 27.3	. . . .	. .	75 16 51.1	+ 2.0
	6	B. A. C. 4643, S. P.	5	46 21.33	− 7.57	− 26.31	302 13 49.48	+ 3 2.99	− 1 36.3	13 45 47.45	+ 7.92	353 21 37.4	+32.6
	7	50 Cassiopeæ (R.) .	.	. . .	. .	. .	212 51 46.22	+ 3 59.06	+ 39.5	. . . .	. .	18 9 56.4	− 2.1
	8	50 Cassiopeæ . .	6	53 29.88	+ 1.89	− 26.31	326 59 51.02	+ 4 25.53	− 39.5	1 53 5.46	+ 0.10	18 9 58.3	− 0.2
	9	α Draconis, S. P. .	5	1 32.05	− 2.32	− 26.31	283 51 48.75	+ 3 13.29	− 4 2.0	14 1 3.42	− 0.10	334 57 21.2	+ 1.4
	10	Lalande 4219² .	9	10 30.37	− 0.86	− 26.31	57 33 52.48	+ 6 11.71	+ 1 36.2	2 10 3.20	− 4.35	108 48 1.6	+22.8
	11	Neptune. . .	9	15 57.03	− 0.42	− 26.31	27 9 50.62	+ 4 0.81	+ 31.4	2 15 30.30	. .	78 20 44.0	. .
	12	ξ² Ceti	9	22 8.54	− 0.47	− 26.31	30 53 52.60	+ 4 15.47	+ 36.7	2 21 41.76	− 4.49	82 5 6.0	+26.8
	13	5 Ursæ Min., S. P.	5	28 14.76	− 3.89	− 26.31	295 5 51.12	+ 4 3.60	− 2 9.5	14 27 44.56	− 0.07	346 14 6.4	+ 2.0
	14	Lalande 4885 .	9	31 45.10	− 0.12	− 26 31	8 29 49.30	+ 5 26.66	+ 9.2	2 31 18.67	− 4.91	59 41 46.4	+26.7
	15	B. A. C. 893. .	9	46 34.39	− 1.27	− 26.31	79 9 50.48	+ 4 41 75	+ 5 12.8	2 46 6.81	− 4.40	130 26 6.2	+19.8
	16	ε Arietis . . .	9	52 42 23	− 0.28	− 26.31	17 57 53.42	+ 4 9.54	+ 19.9	2 52 15.64	− 4.80	69 8 44.1	+26.5
	17	Moon I, N. . .	9	58 27.17	− 0.26	− 26.31	16 39 50.42	+ 4 39.30	+ 18.4	2 58 0.60	+69.56	67 51 9.3	. .
	18	48 Cephei . . .	5	5 22.38	+ 3.00	− 26.31	321 33 49.40	+ 3 25.59	− 48.4	3 4 59.07	+ 0.34	12 42 47.8	− 0.9
	19	Erato . . .	5	11 10.39	− 0.38	− 26.31	24 31 48.82	+ 5 55.49	+ 28.1	3 10 43.70	. .	75 44 33.6	− 2.3
	20	B. A. C. 1074 .	9	21 42.30	− 1.10	− 26.31	75 5 56.52	+ 4 45.04	+ 3 47.9	3 21 14.89	− 4.28	126 20 50.7	+ 20.6
	21	Lacaille 1103 .	5	21 45.66	− 1.10	− 26.31	75 5 56.52	+ 6 58.20	+ 3 48.4	3 21 18.25	− 4.29	126 23 4.3	+20.6
	22	B. A. C. 1085 .	9	23 58.56	− 1.10	− 26.31	75 5 56.52	+ 23.90	+ 3 46.8	3 23 31.15	− 4.28	126 16 28.4	+20.6
	23	η Tauri . . .	9	40 42.07	− 0.23	**− 26.32**	75 5 48.80	+ 3 46.90	+ 16.6	3 40 15.53	+ 0.02	66 16 13.5	+ 0.1
	24	ζ Persei . . .	9	46 55.90	− 0.09	**− 26.29**	7 17 50.75	+ 4 17.38	+ 7.9	3 46 29.50	0.00	58 28 37.2	− 0.8
	25	γ¹ Eridani . . .	9	52 48.98	− 0.78	**− 26.34**	52 39 54.20	+ 3 38.15	+ 1 20.4	3 52 21.89	+ 0.06	103 51 14.0	+ 1.7
	26	γ Tauri . . .	9	13 19.26	− 0.37	**− 26.30**	23 27 49.28	+ 5 18 30	+ 26.7	4 12 52.58	+ 0.01	74 39 55.5	+ 0.7
E.	27	Polaris, S. P. .	7	15 29.23	−36.49	− 26.25	307 29 51.58	+ 4 53.09	− 1 19.0	1 14 26.49	− 0.18	358 39 46.9	− 0.7
	28	α Virginis . . .	7	19 12.11	− 0.76	**− 26.28**	49 19 49.60	+ 4 0.40	+ 1 10.9	13 18 45.10	0.00	100 31 22.1	0.0
	29	η Ursæ Maj., (R.) .	.	. . .	. .	. .	190 57 53.15	+ 3 29.05	+ 11.8	. . . .	. .	40 4 47.2	− 1.2
	30	η Ursæ Majoris .	.	. . .	. .	. .	348 53 50.70	+ 4 48.35	− 11.8	. . . .	. .	40 4 48.4	0.0
	31	η Bootis . . .	9	49 18.16	− 0.28	**− 26.21**	19 47 53 00	+ 4 51.57	+ 21.9	13 48 51.61	− 0.10	70 59 27.7	+ 1.0
	32	α Bootis . . .	9	10 31.43	− 0.25	**− 26.31**	18 59 50.70	+ 4 25.01	+ 20.9	14 10 4.90	+ 0.05	70 10 57.8	+ 1.5
20	33	Sun I, S.. . .	9	44 24.73	− 0.82	− 26.34	58 53 49.62	+ 5 15.42	+ 1 39.6	15 43 57.57	+69.33	110 7 5.8	. .
	34	Sun II, N. . .	5	46 43.40	− 0.82	− 26.34	58 21 53.55	+ 4 44 26	+ 1 37.5	15 46 16.24	−69.34	109 34 36.5	. .
	35	δ Ursæ Minoris .	8	11 31.23	+15.88	− 26.43	312 14 . .	. .	. .	18 11 20.73	+ 0.06	. . . .	. .
	36	α Lyræ. . . .	9	33 13.36	+ 0.32	**− 26.50**	0 9 50.48	+ 3 23.89	+ 0.2	18 32 47.23	+ 0.08	51 19 40.8	+ 0.6
	37	β Lyræ. . . .	9	45 59.59	+ 0.18	**− 26.37**	5 35 51.35	+ 4 19.25	+ 5.9	18 45 33.31	− 0.05	56 46 37.7	+ 0.8
	38	ζ Aquilæ . . .	9	0 13.99	− 0.19	**− 26 50**	25 7 53.78	+ 4 17.79	+ 28.0	18 59 47.33	+ 0.14	76 19 0.8	+ 2.7
	39	Venus I, N.. .	9	5 53.97	− 0.86	− 26.47	64 15 53.00	+ 3 16.53	+ 2 3.1	19 5 26.64	+ 0.77	115 27 33.8	. .
	40	Venus, S. . . .	.	. . .	. .	. .	64 15 53.00	+ 3 36.47	+ 2 3.1	. . . .	. .	115 27 53.8	. .
	41	ε Pegasi . . .	9	38 38.20	− 0.53	**− 26.08**	29 29 51.00	+ 4 11.42	+ 34.2	21 38 11.54	− 0.05	80 40 57.8	+ 1.7
	42	Weisse (2) 1136.	9	48 19.34	− 0.34	− 26.13	19 43 48.25	+ 3 44.45	+ 21.7	21 47 52.87	− 2.72	70 54 15.6	+24.1
	43	O. Arg. N. 23109	9	52 47.93	+ 0.46	− 26.13	350 43 50.82	+ 4 26.34	− 9.8	21 52 22.26	− 1.83	41 54 28.6	+31.6
	44	α Aquarii . . .	9	59 58.06	− 0.72	**− 26.16**	39 43 50.52	+ 3 37.36	+ 50.2	21 59 31.21	+ 0.05	90 54 39.3	− 1.7
	45	B. A. C. 7727 .	9	4 17.04	+ 0.44	− 26.13	351 29 50.35	+ 3 30.32	− 9.0	22 3 51.35	− 2.02	42 39 32.9	+32.4
	46	Groom. 3699 .	9	6 8.84	+ 0.44	− 26.13	351 29 50.35	+ 4 52.52	− 8.9	22 5 43.15	− 2.04	42 40 55.2	+32.5
	47	θ Aquarii . . .	9	10 50.98	− 0.85	**− 26.15**	47 11 47.40	+ 4 12.07	+ 1 5.2	22 10 24.00	+ 0.04	98 23 25.9	+ 0.9
	48	B. A. C. 8013 .	6	55 34.63	+ 1.05	− 26.14	339 39 55.62	+ 4 10.05	− 22.4	22 55 9.54	− 2.35	30 50 4.5	+37.0
	49	Weisse 1232 .	9	59 58.72	− 0.91	− 26.15	49 53 50.40	+ 4 21.86	+ 1 12.0	22 59 31.66	− 3.72	101 5 45.5	+18.8
	50	Saturn I, S. .	4	3 26.38	− 0.86	− 26.15	47 15 50.35	+ 2 28.03	+ 1 5.6	23 2 59.37	+ 0.69	98 25 45.2	. .

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.37	36.0	34.8
30.37	34.0	32.5
30.38	33.2	31.9
30.50	37.0	36.7
30.51	41.0	40.0
30.50	43.5	43.5
30.46	47.5	47.5
30.50	43.8	42.0

For summary of the elements of reduction see page 3.

19. One bisection.
6, 17, 27. Three bisections.
11, 18. Four bisections.
3. Five bisections.

ZENITH-POINT CORR.

No. 1 to 26 + 53.43″
No. 27 to 40 + 53.06
No. 41 to 50 + 53.23

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	− 0.1	. .	. .	− 0.1
17	−16 9.6	+ 15 30.0	. .	− 39.6
33	− 7.7	− 16 14.6	. .	− 16 22.3
34	− 7.6	+ 16 14.6	. .	+ 16 7.0
39	− 9.6	+ 10.0	. .	+ 0.4
40	− 9.6	− 10.0	− 0.0	− 19.6
50	− 0.7	− 9.4	. .	− 10.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
Nov. 20 E.	1	Saturn II, N. .	5	3 27.76	− 0.86	− 26.15	47 15 50.35	+ 2 9.17	+ 1 5.6	23 3 0.75	− 0.69	98 25 26.3	.
	2	Weisse 185 . .	9	11 45.71	− 0.93	− 26.15	51 11 47.68	+ 3 20.56	+ 1 15.4	23 11 18.63	− 3.79	102 22 44.8	+19.
	3	Weisse 228 . .	9	13 8.03	− 0.94	− 26.15	51 39 48.98	+ 2 48.55	+ 1 16.7	23 12 40.94	− 3.80	102 50 15.4	+18.
	4	Weisse 309 . .	9	17 8.53	− 0.92	− 26.15	50 15 53.08	+ 3 6.15	+ 1 13.0	23 16 41.46	− 3.80	101 26 33.4	+19.
	5	Weisse 402 . .	9	22 12.09	− 0.93	− 26.15	50 55 48.75	+ 3 48.96	+ 1 14.8	23 21 45.01	− 3.83	102 7 13.7	+19.
	6	Weisse 427 . .	9	23 9.82	− 0.89	− 26.15	48 45 49.12	+ 2 53.81	+ 1 9.2	23 22 42.78	− 3.80	99 56 13.3	+20.
	7	B. A. C. 8268 (R.)	.	. . .	. .	. .	198 59 51.65	+ 4 47.71	+ 21.0	. . . .	. .	32 1 20.8	+38.
	8	B. A. C. 8268 .	.	. . .	. .	. .	340 51 53.60	+ 3 29.96	− 21.0	. . . .	. .	32 1 23.8	+38.
	9	Polaris . . .	5	14 8.18	+43.99	− 26.18	310 9 53.12	+ 5 11.60	− 1 12.1	1 14 25.99	− 0.51	1 20 13.8	+ 1.
	10	η Piscium (R.). .	.	. . .	. .	. .	155 45 50.15	+ 4 8.27	− 27.4	. . . .	. .	75 16 50.2	+ 1.
	11	η Piscium . . .	.	. . .	. .	. .	24 5 48.42	+ 4 12.90	+ 27.4	. . . .	. .	75 16 49.9	+ 0.
	12	Neptune. . .	9	15 51.18	− 0.50	− 26.19	27 9 52.80	+ 4 26.21	+ 31.5	2 15 24.49	. .	78 21 12.7	.
	13	ξ^2 Ceti	9	22 8.58	− 0.58	− 26.19	30 53 53.58	+ 4 14.09	+ 36.8	2 21 41.81	− 4.50	82 5 5.7	+26.
	14	B. A. C. 777 .	6	26 55.02	+ 2.53	− 26.19	326 31 53.48	+ 5 14.17	− 40.4	2 26 31.36	− 8.59	17 42 48.4	+30.
	15	B. A. C. 893 .	9	46 34.71	− 1.60	− 26.20	79 9 50.05	+ 4 39.66	+ 5 13.8	2 46 6.91	− 4.40	130 26 4.7	+19.
	16	Alceste . . .	4	52 10.93	− 0.47	− 26.20	25 23 49.35	+ 5 21.13	+ 29.2	2 51 44.26	. .	76 36 0.9	− 2.
	17	Erato . . .	4	10 23.16	− 0.46	− 26.20	24 33 52.35	+ 6 28.51	+ 28.2	3 9 56.50	. .	25 47 10.3	− 2.
	18	Taylor 1144. .	4	15 33.51	− 1.69	− 26.21	82 13 51.00	+ 4 47.71	+ 7 10.9	3 15 5.61	− 4.33	133 32 10.8	+19.
	19	B. A. C. 1074 .	4	21 42.70	− 1.48	− 26.21	75 5 53.95	+ 4 44.26	+ 3 48.7	3 21 15.01	− 4.29	126 20 48.1	+20.
	20	Lacaille 1103 .	5	21 45.95	− 1.48	− 26.21	75 5 53.95	+ 6 59.12	+ 3 49.3	3 21 18.26	− 4.29	126 23 3.6	+20.
	21	B. A. C. 1085 .	9	23 58.98	− 1.48	− 26.21	75 5 53.95	+ 25.03	+ 3 47.6	3 23 31.29	− 4.29	126 16 27.8	+20.
	22	B. A. C. 1125 .	9	33 12.97	− 1.61	− 26.21	79 27 54.60	+ 49.02	+ 5 21.3	3 32 45.15	− 4.26	130 40 26.1	+19.
	23	B. A. C. 1136^1 .	4	35 53.35	− 1.61	− 26.21	79 27 54.60	+ 5 0.67	+ 5 23.4	3 35 25.53	− 4.25	130 44 39.9	+19.
	24	B. A. C. 1136^2 .	5	35 53.91	− 1.61	− 26.21	79 27 54.60	+ 5 4.88	+ 5 23.4	3 35 26.09	− 4.25	130 44 44.1	+19.
	25	η Tauri . . .	9	40 42.03	− 0.27	− **26.21**	15 5 48.05	+ 3 46.84	+ 16.7	3 40 15.55	+ 0.01	66 16 12.8	− 0.6
	26	ζ Persei . . .	9	46 55.77	− 0.10	− **26.14**	7 17 51.35	+ 4 17.54	+ 8.0	3 46 29.46	+ 0.05	58 28 38.1	+ 0.1
	27	γ^1 Eridani . . .	9	52 49.13	− 0.98	− **26.29**	52 39 53.60	+ 3 38.29	+ 1 20.7	3 52 21.94	+ 0.11	103 51 13.8	+ 1.4
	28	Moon I, S. . .	9	56 41.83	− 0.24	− 26.22	13 45 55.42	+ 3 24.72	+ 15.2	3 56 15.37	+72.28	64 55 56.5	. .
	29	Moon II . .	9	59 6.40	− 0.24	− 26.22	13 30 . .	. .	. .	3 58 39.94	−72.29	. . . .	. .
P. 27	30	51 Cephei . . .	5	43 36.90	+ 3.68	− 28.35	311 36 . .	. .	. .	6 43 12.23	− 0.47	. . . .	. .
	31	α^2 Geminorum. .	9	27 18.36	+ 0.37	− **28.33**	6 40 . .	. .	. .	7 26 50.37	+ 0.27	. . . .	. .
	32	α Canis Minoris .	9	33 24.19	+ 0.42	− **28.49**	33 16 . .	. .	. .	7 32 56.24	+ 0.02	. . . .	. .
	33	β Geminorum. .	9	38 20.31	+ 0.38	− **28.31**	10 30 . .	. .	. .	7 37 52.32	− 0.08	. . . .	. .
	34	ϕ Geminorum. .	5	46 31.12	+ 0.38	− **28.34**	11 44 . .	. .	. .	7 46 3.13	− 0.09	. . . .	. .
	35	λ Ursæ Min., S. P.	5	45 44.78	− 8.70	− 28.37	307 46 . .	. .	. .	19 45 7.71	− 1.37	. . . .	. .
	36	ε Leonis (R.) . .	.	. . .	. .	. .	165 21 46.28	+ 4 55.19	− 15.4	. . . .	. .	65 39 55.1	0.0
	37	ε Leonis . . .	.	. . .	. .	. .	14 27 49.58	+ 5 29.91	+ 15.4	. . . .	. .	65 39 56.1	+ 1.0
	38	μ Leonis . . .	9	46 18.11	+ 0.37	− **28.35**	12 13 47.78	+ 4 51.18	+ 13.0	9 45 50.06	− 0.07	63 25 13.2	+ 0.9
	39	α Leonis . . .	9	2 21.01	+ 0.40	− **28.47**	26 13 46.00	+ 5 36.44	+ 29.5	10 1 52.99	+ 0.01	77 26 13.1	+ 1.3
	40	Uranus . . .	9	7 50.73	+ 0.40	− 28.42	26 25 48.75	+ 5 20.30	+ 29.7	10 7 22.71	. .	77 37 59.9	. .
	41	γ^1 Leonis . . .	9	13 43.26	+ 0.38	− **28.43**	18 19 48.75	+ 6 4.66	+ 19.9	10 13 15.21	+ 0.02	69 32 34.5	+ 2.4
	42	30 (H) Camelop. .	5	16 35.36	+ 1.48	− 28.43	315 39 47.15	+ 4 28.36	− 58.1	10 16 8.41	−13.01	6 49 38.6	−35.8
	43	9 Draconis (R.) .	.	. . .	. .	. .	217 21 44.92	+ 3 59.81	+ 45.6	. . . .	. .	13 39 50.9	− 1.5
	44	9 Draconis . .	.	. . .	. .	. .	322 29 47.45	+ 4 28.83	− 45.6	. . . .	. .	13 39 51.9	− 0.5
	45	*l* Leonis . . .	9	43 18.97	+ 0.39	− **28.45**	27 38 . .	. .	. .	10 42 50.92	+ 0.04	. . . .	. .
	46	Moon II, S. . .	5	59 19.76	+ 0.40	− 28.44	34 39 50.70	+ 4 8.13	+ 41.5	10 58 51.72	−67.22	85 51 1.5	. .
Dec. 2	47	β Bootis . . .	9	57 50.27	+ 0.37	− **30.64**	357 55 53.48	+ 5 36.21	− 2.1	14 57 19.95	− 0.02	49 7 48.8	− 0.5
	48	μ^1 Bootis . . .	9	20 22.18	+ 0.29	− **30.67**	1 0 . .	. .	. .	15 19 51.78	− 0.06	. . . .	. .
	49	α Cor. Borealis .	9	30 1.01	− 0.01	− **30.66**	11 41 51.00	+ 4 7.41	+ 12.7	15 29 30.31	− 0.02	62 52 32.3	+ 0.2
	50	α Serpentis . .	9	38 45.76	− 0.43	− **30.75**	31 59 54.52	+ 4 33.08	+ 38.1	15 38 14.64	+ 0.09	83 11 26.9	+ 1.2

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
9	30.50	39.0	35.0
29	30.50	36.0	31.5
36	29.97	40.5	39.7
46	29.99	39.0	37.3
47	30.44	34.6	34.2
49	30.43	36.7	36.4

For summary of the elements of reduction see page 3.

20. One bisection.
9, 28, 42, 46. Three bisections.

ZENITH-POINT CORR.

	″
No. 1 to 28	+ 53.23
No. 36 to 46	+ 58.19
No. 47 to 50	+ 53.78

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 0.7	+ 9.5	. .	+ 8.8
12	− 0.1	. .	. .	− 0.1
28	−13 30.8	− 15 40.0	. .	− 29 10.8
40	− 0.2	. .	. .	− 0.2
46	−33 31.8	− 16 9.5	. .	− 49 41.3

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Dec. 2 P. 3	1	ε Serpentis	9	45 14.33	− 0.44	− **30.75**	33 57 57.38	+ 4 18.84	+ 41.0	15 44 43.19	+ 0.04	85 9 18.4	+
	2	Sun I, N.	9	40 1.77	− 0.99	− 30.70	60 43 49.92	+ 4 11.03	+ 1 47.6	16 39 30.08	+70.36	111 56 9.8	
	3	Sun II, S.	9	42 22.50	− 0.99	− 30.70	61 15 55.95	+ 4 32.38	+ 1 50.0	16 41 50.81	−70.37	112 28 39.5	
	4	ε Ursæ Minoris	9	58 45.33	+ 7.28	− 30.70	316 35 52.85	+ 4 42.23	− 56.8	16 58 21.91	− 0.18	7 45 59.5	−
	5	Mercury C.	9	28 24.22	− 1.06	− 30.70	64 1 52.30	+ 4 55.50	+ 2 3.3	17 27 52.46	− 0.11	115 15 12.3	
	6	γ Draconis (R)	.	. . .	. .	. .	192 31 50.50	+ 4 30.60	+ 13.4	. . . .	. .	38 29 46.7	−
	7	γ Draconis	2	54 14.31	+ 0.75	− 30.71	347 19 52.72	+ 3 47.02	− 13.4	17 53 44.35	− 0.25	38 29 47.5	−
	8	δ Ursæ Minoris	5	11 30.54	+17.43	− 30.71	312 13 49.65	+ 4 23.23	− 1 5.7	18 11 17.26	− 0.03	3 23 28.4	−
	9	α Lyræ	9	33 17.44	+ 0.25	− **30.63**	0 9 48.65	+ 3 33.16	+ 0.2	18 32 46.98	− 0.05	51 19 43.2	−
	10	δ Aquilæ	9	19 51.30	− 0.55	− **30.74**	35 55 55.48	+ 4 41.07	+ 43.4	19 19 20.04	+ 0.10	87 7 41.2	+
	11	γ Aquilæ	9	40 57.97	− 0.42	− **30.75**	28 29 50.58	+ 4 16.40	+ 32.6	19 40 26.84	+ 0.07	79 41 0.8	+
	12	α Aquilæ (R.)	.	. . .	. .	. .	149 35 52.50	+ 3 53.94	− 35.0	. . . .	. .	81 27 9.8	
	13	α Aquilæ	.	. . .	. .	. .	30 15 54.95	+ 4 19.79	+ 35.0	. . . .	. .	81 27 10.9	+
	14	β Aquilæ	9	49 49.74	− 0.50	− **30.73**	32 41 54.08	+ 4 57.07	+ 38.5	19 49 18.53	+ 0.06	83 53 50.9	+
	15	Venus I, S.	9	7 6.41	− 1.03	− 30.72	61 45 53.92	+ 4 5.58	+ 1 51.3	20 6 34.66	+ 0.85	112 58 12.0	
	16	Venus N.	.	. . .	. .	. .	61 45 53.92	+ 3 41.81	+ 1 51.3	. . . .	. .	112 57 48.2	
	17	λ Aquarii	9	46 46.87	− 0.73	− **30.85**	47 1 52.32	+ 4 25.95	+ 1 5.2	22 46 15.30	+ 0.11	98 13 44.7	+
	18	α Piscis Aust.	9	51 27.00	− 1.19	− **30.87**	69 3 54.20	+ 3 23.41	+ 2 37.8	22 50 54.97	+ 0.04	120 16 16.6	+
	19	Ino	9	55 0.62	− 0.91	− 30.84	55 55 54.28	+ 5 11.16	+ 1 29.7	22 54 28.87	. .	107 8 56.3	−
	20	Weisse 1261	9	1 33.21	− 0.81	− 30.84	51 15 52.38	+ 4 29.97	+ 1 15.7	23 1 1.56	− 3.60	102 27 59.3	+1
	21	Weisse 57¹	4	6 8.80	− 0.82	− 30.84	51 23 53.72	+ 4 14.66	+ 1 16.1	23 5 37.14	− 3.62	102 35 45.7	+1
	22	Weisse 57²	5	6 9.06	− 0.82	− 30.84	51 23 53.72	+ 4 14.90	+ 1 16.1	23 5 37.40	− 3.62	102 35 45.9	+1
	23	ψ³ Aquarii	9	13 9.01	− 0.77	− 30.84	49 5 55.15	+ 3 14.94	+ 1 10.1	23 12 37.40	− 3.62	100 16 41.4	+1
	24	Weisse 315	9	17 29.69	− 0.77	− 30.84	48 51 52.45	+ 3 52.82	+ 1 9.6	23 16 58.08	− 3.64	100 3 16.1	+1
	25	Weisse 427	9	23 14.17	− 0.77	− 30.84	48 45 54.23	+ 2 50.89	+ 1 9.3	23 22 42.56	− 3.66	99 56 15.7	+1
	26	B. A. C. 8213	6	27 58.82	+17.46	− 30.84	312 11 51.28	+ 4 30.58	− 1 6.7	23 27 45.44	+ 4.75	3 21 36.4	+4
	27	Mars I, S.	4	49 12.83	− 0.62	− 30.84	40 41 51.50	+ 4 0.17	+ 52.3	23 48 41.37	+ 0.43	91 53 5.2	
	28	Mars II, N.	5	49 13.60	− 0.62	− 30.84	40 41 51.50	+ 3 47.56	+ 52.3	23 48 42.14	− 0.34	91 52 52.6	
	29	γ Pegasi	9	7 28.99	− 0.31	− **30.78**	24 17 54.75	+ 4 50.53	+ 27.6	0 6 57.84	− 0.05	75 29 34.1	+
	30	B. A. C. 4165, S.P.	5	15 28.80	−37.73	− 30.84	307 13 50.90	+ 3 20.96	− 1 19.8	12 14 20.23	− 0.52	358 22 13.3	+4
	31	12 Ceti	9	24 21.17	− 0.67	− 30.84	43 25 55.18	+ 4 37.76	+ 57.7	0 23 49.66	− 3.91	94 37 51.8	+2
	32	β Ceti	9	38 0.82	− 0.94	− **30.90**	57 27 54.48	+ 3 34.29	+ 1 35.3	0 37 29.04	+ 0.12	108 39 25.3	+
	33	B. A. C. 262	5	52 43.20	+13.13	− 30.84	313 13 52.18	+ 4 24.20	− 1 4.5	0 52 25.49	−10.36	4 23 33.1	+4
	34	Athor	9	56 40.98	− 0.38	− 30.83	28 9 50.72	+ 4 53.25	+ 32.7	0 56 9.77	. .	79 21 37.9	−
	35	β Andromedæ	9	3 25.76	+ 0.16	− 30.83	3 51 51.00	+ 3 4.88	+ 4.2	1 2 55.09	− 4.21	55 1 21.3	+3
	36	Polaris	5	14 4.14	+44.59	− 30.83	310 9 51.48	+ 5 8.56	− 1 11.9	1 14 17.90	− 1.45	1 20 9.3	+
	37	η Piscium	9	25 29.56	− 0.32	− **30.79**	24 5 52.10	+ 4 10.62	+ 27.3	1 24 58.41	+ 0.04	75 16 51.2	+
	38	50 Cassiopeæ (R.)	.	. . .	. .	. .	212 51 47.65	+ 4 1.73	+ 39.4	. . . .	. .	18 9 52.4	−
	39	50 Cassiopeæ	5	53 33.29	+ 2.60	− 30.83	326 59 53.35	+ 4 19.64	− 39.4	1 53 5.06	− 0.03	18 9 54.8	+
	40	ξ¹ Ceti (R.)	.	. . .	. .	. .	149 17 53.92	+ 5 38.51	− 36.0	. . . .	. .	81 43 24.8	−
	41	ξ¹ Ceti	.	. . .	. .	. .	30 31 51.48	+ 4 36.61	+ 36.0	. . . .	. .	81 43 25.3	+
	42	Brad. 329 (Mira)	4	13 43.88	− 0.66	− 30.83	42 17 53.00	+ 6 39.18	+ 55.6	2 13 12.39	− 4.38	93 31 49.0	+2
	43	Piazzi II, 57	4	13 51.63	− 0.66	− 30.83	42 17 53.00	+ 6 23.83	+ 55.6	2 13 20.14	− 4.38	93 31 33.6	+2
	44	ξ² Ceti	9	22 13.02	− 0.46	− 30.83	30 53 55.02	+ 4 13.93	+ 36.6	2 21 41.73	− 4.51	82 5 6.8	+2
	45	B. A. C. 893	9	46 39.17	− 1.49	− 30.83	79 9 52.72	+ 4 44.76	+ 5 11.5	2 46 6.85	− 4.35	130 26 10.2	+1
	46	Anonymous	9	51 21.34	− 0.20	− 30.83	17 43 52.62	+ 5 41.49	+ 19.6	2 50 50.31	− 4.86	68 56 14.9	+2
	47	B. A. C. 908	5	53 26.03	+ 5.98	− 30.83	317 49 53.68	+ 4 41.12	− 55.1	2 53 1.18	−14.98	9 0 0.9	+3
	48	B. A. C. 4982, S.P.	5	59 12.84	− 9.12	− 30.83	301 51 51.65	+ 3 51.72	− 1 37.5	14 58 32.89	+11.98	353 0 27.1	+3
	49	48 Cephei	5	5 25.96	+ 4.06	− 30.83	321 33 52.70	+ 3 17.61	− 48.2	3 4 59.19	+ 0.44	12 42 43.3	−
	50	Iris	9	17 26.93	− 0.18	− 30.83	17 9 48.65	+ 5 40.72	+ 18.9	3 16 55.92	. .	68 22 9.5	−
	51	ε Eridani	9	27 44.23	− 0.78	− 30.83	48 39 51.60	+ 4 50.69	+ 1 9.3	3 27 12.62	− 4.50	99 52 12.8	+2

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
1	30.42	37.1	37.0
3	30.40	39.2	39.5
4	30.39	39.4	39.7
5	30.38	40.5	41.4
8	30.36	42.6	42.6
10	30.34	43.3	43.2
16	30.34	42.7	42.7
17	30.31	38.2	35.8
36	30.30	36.0	33.4
51	30.27	35.0	33.0

For summary of the elements of reduction see page 3.

12, 13. One bisection.
8, 26, 33, 47, 48. Three bisections.
5. 9. Four bisections.
30, 36. Five bisections.

ZENITH-POINT CORR.

No. 1 to 16 + 53″.78
No. 17 to 51 + 55.00

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′
2	− 7.8	+ 16 14.8	. .	+ 16 7
3	− 7.9	− 16 14.8	. .	− 16 22
5	− 5.8	. .	+ 0.0	− 5
15	− 10.8	− 12.0	. .	− 22
16	− 10.8	+ 12.0	− 0.2	+ 1
27	− 6.8	− 6.4	. .	− 13
28	− 6.8	+ 6.4	− 0.2	− 0

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
					Inst.	Clock.		Instrument.	Refraction.				
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Dec. 3 P.	1	Thetis . . .	9	37 22.91	− 0.39	− 30.83	27 19 52.75	+ 6 32.84	+ 31.6	3 36 51.69	. .	78 33 18.4	−
	2	ζ Ursæ Min., s. P. .	9	48 58.16	− 5.57	− 30.83	297 1 50.95	+ 3 43.54	− 1 58.8	15 48 21.76	− 0.02	348 9 56.9	+
	3	B. A. C. 5352, S. P.	5	56 43.12	− 9.47	− 30.83	302 9 49.58	+ 4 1.27	− 1 36.6	15 56 2.82	+16.49	353 18 35.4	+2
	4	B. A. C. 1247 .	5	0 38.60	+ 8.54	− 30.82	315 19 50.22	+ 4 22.03	− 1 0.2	4 0 16.32	−24.07	6 29 33.2	+2
	5	Weisse 326 . .	9	17 52.80	− 0.56	− 30.82	36 3 52.85	+ 3 37.43	+ 44.6	4 17 21.42	− 4.76	87 14 36.1	+1
	6	Weisse 381 . .	9	20 12.04	− 0.59	− 30.82	38 1 52.50	+ 5 39.86	+ 48.0	4 19 40.63	− 4.72	89 14 41.6	+1
	7	Weisse 544 . .	9	27 47.51	− 0.59	− 30.82	38 1 52.50	+ 4 59.73	+ 47.9	4 27 16.10	− 4.73	89 14 1.3	+1
	8	Weisse 685 . .	9	33 22.20	− 0.57	− 30.82	36 53 53.32	+ 5 37.67	+ 46.0	4 32 50.81	− 4.76	88 6 38.2	+1
	9	Melpomene. .	9	36 28.60	− 0.57	− 30.82	36 55 53.68	+ 5 25.48	+ 46.1	4 35 57.21	. .	88 8 26.5	−
	10	Weisse 902 . .	9	43 45.63	− 0.57	− 30.82	36 47 57.25	+ 5 31.50	+ 45.8	4 43 14.24	− 4.76	88 0 35.8	+16
	11	ε Ursæ Min., s. P. .	9	59 1.06	− 8.22	− 30.82	301 5 52.72	+ 3 27.22	− 1 40.8	16 58 22.02	− 0.05	352 14 0.3	+ 0
	12	Durch. 27°, 744.	9	9 46.46	− 0.06	− 30.82	11 13 51.20	+ 4 40.20	+ 12.2	5 9 15.58	− 5.59	62 25 4.8	+13
	13	B. A. C. 1662 .	5	23 40.25	+11.61	− 30.82	313 41 49.62	+ 5 2.70	− 1 3.7	5 23 21.04	−35.27	4 52 9.8	+ 8
	14	B. A. C. 1794¹ .	4	35 9.26	− 0.64	− 30.82	40 47 53.55	+ 5 12.40	+ 52.9	5 34 37.80	− 4.65	92 0 20.1	+12
	15	B. A. C. 1794² .	5	35 9.46	− 0.64	− 30.82	40 47 53.55	+ 5 15.61	+ 52.9	5 34 38.00	− 4.65	92 0 23.3	+12
	16	ψ¹ Draconis, s. P. .	5	44 37.12	− 3.84	− 30.82	291 3 52.92	+ 4 50.63	− 2 36.9	17 44 2.46	+ 0.15	342 12 27.9	+ 0.
	17	ψ² Draconis, s. P. .	5	44 38.74	− 3.84	− 30.82	291 3 52.92	+ 5 19.42	− 2 36.8	17 44 4.08	+ 5.41	342 12 56.7	+ 3.
	18	B. A. C. 1879 .	5	58 53.28	+17.94	− 30.82	312 3 52.92	+ 5 7.94	− 1 7.4	5 58 40.40	−52.29	3 14 14.7	+ 1.
	19	Euphrosyne .	9	3 50.79	+ 1.00	− 30.82	341 37 56.48	+ 4 52.54	− 20.3	6 3 20.97	. .	32 48 49.9	+ 1.
	20	δ Ursæ Min., s. P. .	5	12 6.18	−18.15	− 30.82	305 27 54.38	+ 3 41.77	− 1 25.4	18 11 17.21	+ 0.03	356 36 32.0	+ 1.
	21	23 (H.) Camelop. (R.)	.	. . .	. .	. .	220 43 53.20	+ 3 3.78	+ 52.7	. . . .	. .	10 18 31.5	− 2.
	22	23 (H.) Camelop. .	5	25 56.43	+ 5.11	− 30.82	319 7 56.55	+ 5 8.32	− 52.7	6 25 30.72	−18.64	10 18 33.4	− 2.
	23	B. A. C. 2194 (R.)	.	. . .	. .	. .	166 17 49.60	+ 3 51.56	− 14.8	. . . .	. .	64 44 54.8	+ 2.
	24	B. A. C. 2194 .	.	. . .	. .	. .	13 33 53.22	+ 4 24.61	+ 14.8	. . . .	. .	64 44 53.8	+ 2.
	25	51 Cephei . . .	5	43 24.76	+20.89	− 30.82	311 36 . .	. . .	. .	6 43 14.83	+ 0.16	. . . . .	
	26	ε Canis Majoris .	9	54 23.51	− 1.18	− **30 92**	67 35 53.85	+ 3 29.20	+ 2 27.8	6 53 51.51	+ 0.05	118 48 12.0	− 0.
	27	δ Canis Majoris .	9	3 59.26	− 1.12	− **30.82**	64 59 53.25	+ 3 23.62	+ 2 10.8	7 3 27.33	− 0.04	116 11 48.9	+ 1.
	28	δ Draconis, s. P. .	9	13 2.10	− 3.04	− 30.81	286 19 49.92	+ 4 7.81	− 3 25.2	19 12 28.25	+ 1.15	337 26 53.7	+ 0.
	29	α² Geminorum. .	9	27 21.30	+ 0.05	− **30.75**	6 39 52.62	+ 4 22.51	+ 7.2	7 26 50.54	+ 0.24	57 50 43.5	+ 0.
	30	α Canis Minoris .	9	33 27.61	− 0.51	− **30.82**	33 15 52.38	+ 4 47.97	+ 40.2	7 32 56.29	− 0.09	84 27 41.8	− 1.
	31	β Geminorum. .	9	38 23.39	− 0.05	− **30.76**	10 29 50.78	+ 4 24.89	+ 11.4	7 37 52.53	− 0.07	61 40 48.3	− 0.
	32	λ Ursæ Min., s. P. .	5	46 29.40	−56.61	− 30.81	307 45 50.05	+ 5 34.87	− 1 18.6	19 45 1.98	− 1.46	358 56 27.5	+ 1.
E. 6	33	Weisse 315 . .	.	. . .	. .	. .	48 51 47.82	+ 3 58.55	+ 1 8.4	. . . .	. .	100 3 16.0	+19.
	34	Weisse 377 . .	.	. . .	. .	. .	49 31 51.30	+ 2 56.28	+ 1 10.0	. . . .	. .	100 42 18.8	+18.
	35	ι Piscium . . .	9	34 12.63	− 0.19	− **31.43**	33 49 50.62	+ 5 8.57	+ 40.2	23 33 41.00	− 0.04	85 2 0.6	+ 1.
	36	Anonymous .	9	42 5.88	− 0.30	− 31.44	44 25 47.22	+ 3 21.45	+ 58.6	23 41 34.14	− 3.68	95 36 28.5	+21.
	37	Weisse (2) 1027.	9	51 0.46	− 0.01	− 31.44	16 49 46.58	+ 5 14.48	+ 18.2	23 50 29.01	− 3.48	68 1 40.5	+31.
	38	ω Piscium . . .	9	53 35.04	− 0.18	− **31.47**	32 37 49.50	+ 3 48.77	+ 38.4	23 53 3.42	+ 0.03	83 48 37.9	+ 1.
	39	B. A. C. 8359 .	9	58 28.07	+ 0.86	− 31.44	337 13 48.25	+ 3 25.76	− 25.0	23 57 57.49	− 3.15	28 23 10.2	+40.
	40	α Andromedæ .	7	2 36.85	+ 0.07	− **31.43**	10 23 44.25	+ 4 30.29	+ 11.1	0 2 5.48	+ 0.02	61 34 46.8	+ 1.
	41	Polaris . . .	2	14 23.15	+25.50	− 31.44	310 10 . .	. . .	. .	1 14 17.21	− 0.41	. . . . .	
F. 7	42	α Serpentis . .	9	38 46.80	− 0.26	− **31.86**	31 59 50.35	+ 4 38.10	+ 37.7	15 38 14.57	− 0.08	83 11 27.3	+ 0.
	43	ε Serpentis . .	7	45 15.40	− 0.28	− **31.90**	33 58 . .	. . .	. .	15 44 43.16	− 0.07	. . . . .	
	44	α Scorpii . . .	9	22 27.29	− 0.60	− **32.11**	64 56 . .	. . .	. .	16 21 54.75	+ 0.15	. . . . .	
8	45	α Lyræ	9	33 18.59	+ 0.16	− **31 71**	0 9 55.65	+ 3 26.99	+ 0.2	18 32 46.89	− 0.12	51 19 44.0	− 0.
	46	β Lyræ	9	46 4.94	+ 0 08	− **31.75**	5 35 52.90	+ 4 20.96	+ 5.8	18 45 33.17	− 0.06	56 46 40.9	− 0.
	47	ζ Aquilæ . . .	9	0 19.19	− 0.16	− **31.81**	25 7 52.30	+ 4 21.81	+ 27.6	18 59 47.19	+ 0.08	76 19 2.9	+ 2.
	48	α Aquilæ . . .	9	45 21.10	− 0.22	− **31.81**	30 15 50.45	+ 4 25.72	+ 34.3	19 44 49 06	+ 0.03	81 27 11.7	+ 1.
	49	β Aquilæ . . .	9	49 50.67	− 0.24	− **31.94**	32 41 50.98	+ 5 1.65	+ 37.7	19 49 18.62	+ 0.17	83 53 51.5	+ 2.
	50	Moon I, S. . .	9	21 59.51	− 0.52	− 31.79	61 11 49.75	+ 4 49.76	+ 1 46.6	20 21 27.20	+66.71	112 24 47.3	.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
4	30.28	33.0	31.6
20	30.26	33 0	31.3
32	30.25	32.0	30.3
33	30.02	40.8	38.5
42	30.17	39.0	37.8
46	30.12	60.4	49.0

For summary of the elements of reduction see page 3.

ZENITH-POINT CORR.

3, 4, 11, 13, 18, 20, 50. Three bisections. No. 1 to 32 + 55.″00
2, 29. Four bisections. No. 33 to 40 + 56.40
32. Five bisections. No. 42 to 50 + 55.38

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
50	−48 1.9	− 14 59.7	. .	−1 3 1.

ATE ND IS'R.	Number.		OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH-DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
377.					m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
c. 8	1		Venus I, S.	9	29 0.49	− 0.51	− 31.79	60 23 49.22	+ 4 4.62	+ 1 43.1	20 28 28.19	+ 0.89	111 35 58.1	. .
F.	2		Venus N.	. .	. .	. .	. .	60 23 49.22	+ 3 39 40	+ 1 43.1	. .	. .	111 35 32.9	. .
	3	α	Cygni	5	37 46.70	+ 0.31	**− 31.86**	353 57 44.65	+ 5 10.66	− 6.1	20 37 15.23	+ 0.12	45 9 10.4	+ 1.2
	4	ν	Cygni	9	53 8.12	+ 0.23	**− 31.87**	358 7 49.65	+ 3 49.33	− 1.8	20 52 36.57	+ 0.13	49 17 58.4	+ 2.1
	5		Ino	9	1 57.11	− 0.42	− 32 01	55 17 48.42	+ 6 32.20	+ 1 25.8	23 1 24.68	. .	106 32 7.6	− 3.5
	6		Weisse 49	8	5 39.99	− 0.36	− 32.01	49 57 45.20	+ 4 57.77	+ 1 10.7	23 5 7.62	− 3.54	101 10 14.9	+17.9
	7		Weisse 57¹	3	6 9.62	− 0.38	− 32.01	51 23 47.45	+ 4 20.34	+ 1 14.4	23 5 37.23	− 3.57	102 35 43.4	+17.4
	8		Weisse 57²	4	6 9.83	− 0.38	− 32.01	51 23 47.45	+ 4 22.55	+ 1 14.4	23 5 37.44	− 3.57	102 35 45.6	+17.4
	9		Weisse 185	9	11 50.86	− 0.37	− 32.01	51 11 47.45	+ 3 23.07	+ 1 13.9	23 11 18.48	− 3.59	102 22 45.6	+17.8
	10		Weisse 228	6	13 13.19	− 0.38	− 32.01	51 39 47.70	+ 2 52.29	+ 1 15.1	23 12 40.80	− 3.60	102 50 16.3	+17.7
	11		Weisse 315	9	17 30.48	− 0.35	− 32.01	48 51 49.88	+ 3 56.64	+ 1 8.1	23 16 58.12	− 3.58	100 3 15.8	+18.9
	12		Weisse 377	9	20 49.46	− 0.36	− 32.01	49 31 47.35	+ 3 1.43	+ 1 9.7	23 20 17.09	− 3.61	100 42 19.7	+18.8
	13		Weisse 427	9	23 15.02	− 0.36	− 32.01	48 45 49.30	+ 2 55.97	+ 1 7.8	23 22 42.65	− 3.61	99 56 14.3	+19.2
	14	ι	Piscium	9	34 13.19	− 0.19	**− 32.01**	33 49 48.80	+ 5 10.03	+ 40.0	23 33 40.98	− 0.04	85 2 0.0	+ 0.4
	15	ω	Piscium	9	53 35.57	− 0.18	**− 32.02**	32 37 47.08	+ 3 50.95	+ 38.2	23 53 3.37	0.00	83 48 37.4	+ 0.6
	16	α	Andromedæ	9	2 37.36	+ 0.11	**− 32.01**	10 23 48.22	+ 4 26.40	+ 11.0	0 2 5.44	+ 0.01	61 34 46.8	+ 1.7
	17	γ	Pegasi	3	7 29.98	− 0.08	**− 32.05**	24 17 48.65	+ 4 55.71	+ 27.1	0 6 57.87	+ 0.03	75 29 32.7	+ 1.6
	18		B. A. C. 259	9	50 31.67	+ 0.25	− 32.04	0 59 46.12	+ 3 20.83	+ 1.1	0 49 59.88	− 4.03	52 9 29.3	+36.2
	19		Athor	9	57 33.83	− 0.13	− 32.04	27 53 44.62	+ 6 8.77	+ 31.9	0 57 1.66	. .	79 6 46.5	− 2.5
	20		Polaris	5	14 19.98	+27.90	− 32.05	310 9 56.55	+ 5 0.89	− 1 10.9	1 14 15.83	− 0.36	1 20 7.7	+ 0.6
	21	θ¹	Ceti	9	18 29.11	− 0.36	**− 32.09**	47 37 50.15	+ 3 28.30	+ 1 6.0	1 17 56.70	+ 0.04	98 48 45.6	+ 2.5
	22	β	Arietis	9	48 27.29	− 0.03	**− 31.97**	18 35 51.30	+ 4 36.24	+ 20.3	1 47 55.20	− 0.07	69 47 9.0	+ 1.8
	23	α	Arietis	9	0 51.14	+ 0.01	**− 32.04**	15 56 . .	. .	. .	2 0 19.09	− 0.01	. .	. .
	24		Neptune.	9	14 22.50	− 0.13	− 32.06	27 17 51.22	+ 3 55.37	+ 31.2	2 13 50.31	. .	78 28 39.0	. .
	25	γ	Ceti	9	37 32.56	− 0.23	**− 32.13**	36 5 49.10	+ 3 41.76	+ 44.0	2 37 0.26	+ 0.05	87 16 36.1	− 0.3
	26	ζ	Arietis	6	8 27.04	− 0 02	**− 32.05**	18 13 44.48	+ 3 54.81	+ 20.0	3 7 54.94	− 0.03	69 24 20.5	+ 1.8
	27		Thetis	9	33 7.61	− 0.14	− 32.09	27 25 53.70	+ 5 15.70	+ 31.4	3 32 35.38	. .	78 38 2.0	− 2.2
	28	γ¹	Eridani	9	52 54.54	− 0.42	**− 32.13**	52 39 54.05	+ 3 44.71	+ 1 19.2	3 52 22.03	+ 0.07	103 51 19.2	+ 3.3
	29	γ	Tauri	9	13 25.00	− 0.09	**− 32.10**	23 27 46.20	+ 5 22.53	+ 26.3	4 12 52.81	+ 0.02	74 39 56.2	+ 1.0
	30		Weisse 326	4	17 53.86	− 0.23	− 32.10	36 3 50.05	+ 3 40.37	+ 44.1	4 17 21.53	− 4.80	87 14 35.7	+18.1
	31		Weisse 548	9	27 56.70	− 0.23	− 32.10	35 37 47.52	+ 3 34.45	+ 43.4	4 27 24.37	− 4.83	86 48 26.6	+17.3
	32		Lalande 8824	9	35 13.23	− 0.26	− 32.10	38 3 48.15	+ 5 26.20	+ 47.5	4 34 40.87	− 4.78	89 16 23.1	+16.6
	33		Anonymous	9	37 38.96	− 0.24	− 32.10	36 55 43.58	+ 6 17.18	+ 45.6	4 37 6.62	− 4.81	88 9 7.6	+16.4
	34	β	Orionis	9	9 14.72	− 0.36	**− 32.13**	47 9 53.88	+ 3 9.27	+ 1 5.4	5 8 42.25	+ 0.02	98 20 29.8	+ 0.8
	35	β	Tauri	9	19 8.77	+ 0.08	**− 32.08**	10 17 48.10	+ 5 21.56	+ 11.1	5 18 36.74	− 0.02	61 29 42.0	− 0.1
′. 9	36	ε	Delphini	9	27 54.89	− 0.21	**− 32.25**	27 55 49.92	+ 3 54.35	+ 32.1	20 27 22.41	+ 0.04	79 6 37.6	+ 1.5
	37		Venus I, S.	9	33 15.91	− 0.63	− 32.27	60 5 50.30	+ 4 11.13	+ 1 45.1	20 32 43.01	+ 0.90	111 18 7.7	. .
	38		Venus N.	. .	. .	. .	. .	60 5 50.30	+ 3 45.81	+ 1 45.1	. .	. .	111 17 42.4	. .
	39	α	Cygni	9	37 47.03	+ 0.38	**− 32.28**	353 57 51.62	+ 5 3.70	− 6.3	20 37 15.14	+ 0.05	45 9 10.2	+ 0.8
	40	γ¹	Delphini	4	41 30.78	− 0.14	− 32.27	23 7 50.52	+ 4 12.37	+ 25.9	20 40 58.37	− 2.14	74 18 50.0	+15.0
	41	γ²	Delphini	5	41 31.66	− 0.14	− 32.27	23 7 50.52	+ 4 12.83	+ 25.9	20 40 59.25	− 2.14	74 18 50.5	+15.0
	42	ν	Cygni	9	53 8.46	+ 0.27	**− 32.26**	358 7 50.58	+ 3 48.79	− 1.9	20 52 36.46	+ 0.03	49 17 58.7	+ 2.3
	43	61¹	Cygni	9	1 56.79	+ 0.22	− 32.26	0 39 47.30	+ 4 41.98	+ 0.8	21 1 24.75	− 0.08	51 50 51.3	+ 1.4
	44	ζ	Cygni	9	8 16.16	+ 0.06	**− 32.28**	9 5 50.68	+ 3 53.36	+ 9.8	21 7 43.96	+ 0.05	60 16 15.0	+ 0.6
	45		Moon I, S.	9	11 37.84	− 0.61	− 32.26	56 51 50.88	+ 3 10.52	+ 1 32.8	21 11 4.97	+64.37	108 2 55.4	. .
	46	ι	Capricorni	9	15 59.79	− 0.59	− 32.26	56 9 50.98	+ 3 35.75	+ 1 30.4	21 15 26.94	− 3.14	107 21 18.3	+ 8.6
	47	ι	Draconis, S. P.	5	20 19.03	− 5.55	− 32.26	300 43 48.92	+ 3 3.88	− 1 41.4	9 19 41.22	− 0.32	351 51 32.6	− 0.7
	48	δ	Ursæ Maj., S. P.	5	24 18.00	− 2.45	− 32.26	289 13 45.10	+ 4 24.95	− 2 51.6	9 23 43.29	− 0.09	340 21 39.6	+ 0.3
	49	226	Cephei (R.).	.	. .	. .	. .	216 37 50.30	+ 3 58.13	+ 45.3	. .	. .	14 23 47.5	− 1.8

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.11	48.2	48.6
30.12	43.5	42.5
30.12	39.4	37.0
30.17	38.0	30.6
30.19	36.8	34.5
30.37	38.8	38.2
30.38	37.8	37.1
30.37	36.7	35.3

For summary of the elements of reduction see page 3.

7, 8, 24. One bisection.
46. Three bisections.
32, 45. Four bisections.
20. Five bisections.

ZENITH-POINT CORR.

		″
No.	1 to 4	+ 55.38
No.	5 to 35	+ 56.37
No.	36 to 49	+ 56.14

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	″
1	− 11.1	− 12.7	. .	− 23.8
2	− 11.1	+ 12.7	− 0.2	+ 1.4
24	− 0.1	. .	. .	− 0.1
37	− 11.2	− 12.8	. .	− 24.0
38	− 11.2	+ 12.8	− 0.3	+ 1.3
45	−45 33.0	+ 14 53.4	. .	−1 0 26.4

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Dec. 9	1	226 Cephei . . .	4	30 34.60	+ 2.48	− 32.26	323 13 50.82	+ 4 22.47	− 45.3	22 30 4.82	− 0.12	14 23 49.2	−
P.	2	ζ Pegasi . . .	9	35 55.12	− 0.24	− **32.18**	28 37 52.58	+ 3 26.34	+ 33.3	22 35 22.62	+ 0.01	79 48 13.4	+ 1
	3	λ Aquarii (R.) . .	.	. . .	. .	. .	132 49 50.15	+ 3 53.58	− 1 5.5	. . . .	. .	98 13 43.0	+
	4	λ Aquarii . . .	.	. . .	. .	. .	47 1 49.42	+ 4 26.27	+ 1 5.5	. . . .	. .	98 13 42.4	+
	5	ι Piscis Australis	9	51 27.96	− 0.79	− **32.32**	69 3 55.70	+ 3 19.01	+ 2 38.6	22 50 54.92	+ 0.08	120 16 14.5	+
	6	Weisse 1232 .	9	0 4.22	− 0.51	− 32.25	49 53 51.65	+ 4 20.65	+ 1 12.5	22 59 31.46	− 3.50	101 5 46.0	+17
	7	Ino	9	3 22.62	− 0.58	− 32.25	55 11 48.80	+ 4 42.10	− 1 27.8	23 2 49.79	. .	106 24 19.9	− 3
	8	Weisse 228 . .	9	13 13.44	− 0.54	− 32.25	51 39 50.05	+ 2 46.53	+ 1 17.2	23 12 40.65	− 3.59	102 50 15.0	+17
	9	Weisse 315 . .	9	17 30.71	− 0.51	− 32.25	48 51 48.90	+ 3 53.96	+ 1 10.0	23 16 57.95	− 3.56	100 3 14.1	+18
	10	θ Piscium . . .	9	22 19.67	− 0.30	− **32.22**	33 5 52.60	+ 4 28.61	+ 39.9	23 21 47.12	+ 0.02	84 17 22.3	+ 1
	11	ι Piscium . . .	9	34 13.50	− 0.30	− **32.22**	33 49 50.08	+ 5 7.78	+ 41.1	23 33 40.96	− 0.05	85 2 0.2	+ 0
E. 10	12	Moon I, S. . .	5	58 6.96	− 0.57	− 32.33	51 51 55.48	+ 3 8.15	+ 1 15.6	21 57 34.06	+62.54	103 2 40.4	.
	13	B. A. C. 7727 .	9	4 22.89	+ 0.32	− 32.33	351 29 49.95	+ 3 30.95	− 8.8	22 3 50.88	− 1.56	42 39 33.3	+31
	14	Groom. 3699 .	9	6 14.62	+ 0.32	− 32.33	351 29 49.95	+ 4 53.86	− 8.8	22 5 42.61	− 1.58	42 40 56.2	+31
	15	π Aquarii . . .	9	19 35.51	− 0.42	− **32.28**	38 3 49.48	+ 3 30.46	+ 46.6	22 19 2.76	− 0.02	89 14 27.7	+ 1
	16	Weisse (2) 467 .	9	22 37.51	+ 0.13	− 32.33	359 37 49.05	+ 4 17.90	− 0.3	22 22 5.31	− 2.16	50 48 27.9	+31.
	17	η Aquarii . . .	9	29 38.06	− 0.43	− **32.32**	39 33 49 48	+ 3 44.02	+ 49.2	22 29 5.30	+ 0.03	90 44 43.9	+ 0.
	18	ζ Pegasi . . .	9	35 55.33	− 0.30	− **32.34**	28 37 47.70	+ 3 32.65	+ 32.5	22 35 22.70	+ 0.10	79 48 14.1	+ 2.
	19	B. A. C. 7931¹ .	4	39 6.46	+ 0.12	− 32.33	359 59 47.50	+ 4 1.64	+ 0.1	22 38 34.25	− 2.36	51 10 10.4	+32.
	20	B. A. C. 7931² .	5	39 6.73	+ 0.12	− 32.33	359 59 47.50	+ 4 2.51	+ 0.1	22 38 34.52	− 2.36	51 10 11.3	+32.
	21	λ Aquarii . . .	9	46 48.04	− 0.52	− **32.30**	47 1 47.42	+ 4 31.41	+ 1 4.0	22 46 15.19	+ 0.07	98 13 44.0	+ 1.
	22	α Piscis Australis	9	51 28.03	− 0.80	− **32.39**	69 3 53.45	+ 3 26.58	+ 2 34.8	22 50 54.90	+ 0.07	120 16 16.0	+ 2.
	23	Weisse 1261 .	9	1 34.44	− 0.58	− 32.33	51 15 48.00	+ 4 36.59	+ 1 14.3	23 1 1.53	− 3.52	102 28 0.1	+17.
	24	Ino	2	4 48.85	− 0.63	− 32.33	55 3 51.72	+ 4 49.94	+ 1 25.4	23 4 15.89	. .	106 16 28.3	− 3.
	25	ψ¹ Aquarii . . .	9	10 3.29	− 0.55	− 32.33	48 33 48.85	+ 3 53.20	+ 1 7.6	23 9 30.41	− 3.52	99 45 10.8	+18.
	26	ψ³ Aquarii . . .	9	13 10.27	− 0.55	− 32.33	49 5 47.70	+ 3 23.45	+ 1 8.8	23 12 37.39	− 3.55	100 16 41.2	+18.
	27	Weisse 402 . .	9	22 17.69	− 0.58	− 32.33	50 55 47.02	+ 3 54.49	+ 1 13.5	23 21 44.78	− 3.61	102 7 16.2	+18.
	28	Weisse 427 . .	9	23 15.38	− 0.55	− 32.33	48 45 49.20	+ 2 57.06	+ 1 8.1	23 22 42.50	− 3.59	99 56 15.6	+19.
	29	B. A. C. 8229 .	9	32 21.56	+ 0.19	− 32.33	356 13 48.75	+ 4 3.62	− 3.9	23 31 49.42	− 2.94	47 24 9.7	+36.
	30	B. A. C. 8268 (R.)	.	. . .	. .	. .	198 59 50.72	+ 4 52.34	+ 20.7	. . . .	. .	32 1 17.4	+39.
	31	B. A. C. 8268 .	2	41 37.34	+ 0.66	− 32.33	340 51 49.15	+ 3 30.92	− 20.7	23 41 5.67	− 2.74	32 1 20.6	+39.
	32	Durch. 70°, 1340	7	55 2.54	+ 1.53	− 32.33	327 59 48.95	+ 2 52.81	− 37.3	23 54 31.74	− 2.61	19 8 25.7	+41.
	33	Σ 3052¹ . . .	9	57 11.83	+ 1.52	− 32.33	328 7 51.40	+ 5 15.80	− 37.0	23 56 41.02	− 2.70	19 18 51.4	+41.
	34	Σ 3052² . . .	9	57 12.93	+ 1.52	− 32.33	328 7 51.40	+ 4 43.05	− 37.0	23 56 42.12	− 2.70	19 18 18.6	+41.
	35	γ Pegasi (R.) . .	.	. . .	. .	. .	155 31 46.60	+ 5 29.61	− 27.1	. . . .	. .	75 29 32.1	+ 1.
	36	γ Pegasi . . .	.	. . .	. .	. .	24 17 50.08	+ 4 54.01	+ 27.1	. . . .	. .	75 29 32.4	+ 1.
	37	B. A. C. 226 . .	9	43 20.04	+ 0.28	− 32.33	351 43 54.60	+ 3 36.23	− 8.7	0 42 47.99	− 3.96	42 53 43.3	+38.
	38	B. A. C. 253 . .	9	49 53.68	+ 0.74	− 32.33	338 45 50.60	+ 4 29 58	− 23.2	0 49 24.09	− 4.24	29 56 18.2	+40.
	39	Athor . . .	5	58 7.41	− 0.32	− 32.33	27 47 53.80	+ 5 13.27	+ 31.8	0 57 34.76	. .	79 0 0.1	− 2.
	40	Polaris . . .	8	14 17.52	+28.95	− 32.33	310 9 53.25	+ 5 1.87	− 1 10.9	1 14 14.14	− 0.42	1 20 5.4	− 1.
	41	B. A. C. 495 . .	9	33 14.48	− 0.25	− 32.33	22 47 51.75	+ 4 49.63	+ 25.4	1 32 41.90	− 4.27	73 59 28.0	+29.
	42	ο Piscium . . .	9	39 30.97	− 0.34	− **32.37**	30 15 50.50	+ 4 28.42	+ 35.2	1 38 58.30	− 0.01	81 27 15.3	− 0.
	43	Weisse 767 . .	9	44 57.51	− 0.32	− 32.33	28 21 48.28	+ 4 48.91	+ 32.6	1 44 24.86	− 4.31	79 33 31.0	+27.
	44	β Arietis . . .	9	48 27.79	− 0.20	− **32.31**	18 36 . .	. .	. .	1 47 55.26	0.00	. . . .	. .
	45	α Arietis . . .	9	0 51.59	− 0.17	− **32.32**	15 55 49.22	+ 4 15.22	+ 17.3	2 0 19.09	0.00	67 6 42.9	+ 1.
	46	Neptune . . .	9	14 14.33	− 0.31	− 32.33	27 17 49.42	+ 4 36.73	+ 31.4	2 13 41.69	. .	78 29 18.8	. .
F. 11	47	B. A. C. 8268 .	5	41 37.77	+ 0.82	− 32.85	340 51 47.25	+ 3 31.81	− 20.1	23 41 5.74	− 2.71	32 1 20.2	+39.
	48	Weisse 1114 .	9	56 8.24	− 0.41	− 32.85	42 31 47.18	+ 3 19.34	+ 53.5	23 55 34.98	− 3.68	93 42 21.2	+22.
	49	α Andromedæ .	9	2 38.18	+ 0.02	− **32.78**	10 23 49.58	+ 4 25.08	− 10.8	0 2 5.34	− 0.05	61 34 46.7	+ 1.
	50	γ Pegasi . . .	9	7 30.84	− 0.18	− **32.84**	24 17 47.30	+ 4 58.44	+ 26.4	0 6 57.80	− 0.01	75 29 33.3	+ 1.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
11	30.36	35.2	32.4
12	30.10	45.0	43.0
46	30.12	38.0	35.0
48	30.09	51.0	52.0

For summary of the elements of reduction see page 3.

40. Three bisections.
12. Five bisections.

ZENITH-POINT CORR.

	″
No. 1 to 11	+ 56.14
No. 12 to 46	+ 54.88
No. 47 to 50	+ 55.46

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
12	−42 34.9	− 14 49.5	. .	− 57 24.4
46	− 0.1	. .	. .	− 0.1

ATE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
377.				m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
c. 11	1	B. A. C. 69 . .	9	15 24.87	− 0.93	− 32.86	78 39 49.80	+ 4 15.97	+ 4 44.5	0 14 51.08	− 4.16	129 55 11.5	+11.3
F.	2	Lacaille 61 . .	9	17 18.70	− 0.93	− 32.86	78 39 49.80	+ 5 35.86	+ 4 45.1	0 16 44.91	− 4.17	129 56 32.0	+11.4
	3	Lacaille 81 . .	9	19 54.99	− 0.93	− 32.86	78 39 49.80	+ 5 16.49	+ 4 44.9	0 19 21.20	− 4.17	129 56 12.4	+11.5
	4	β Ceti	9	38 2 51	− 0.60	− **33.02**	57 27 54.45	+ 3 39.84	+ 1 31.3	0 37 29.05	+ 0.22	108 39 26.8	+ 2.5
	5	Athor . . .	3	58 26.38	− 0.23	− 32.86	27 43 50.38	+ 5 36.94	+ 30.8	0 57 53.29	. .	78 56 19.3	− 2.4
	6	Polaris . . .	5	14 13.48	+32.89	− 32 86	310 9 57.28	+ 4 56.68	− 1 8.7	1 14 13.51	− 0.25	1 20 6.5	+ 0.1
	7	θ^1 Ceti . . .	9	18 30.10	− 0.48	− **32.99**	47 38 . .	. . .	. .	1 17 56.76	+ 0.13	. . . .	. .
	8	η Piscium . . .	5	25 31.42	− 0.18	− **32.84**	24 5 51.68	+ 4 12.15	+ 26.2	1 24 58.38	+ 0.06	75 16 51.2	+ 1.9
	9	B. A. C. 508[1] .	7	34 46.02	+ 0.82	− 32 87	340 49 51.50	+ 3 11.00	− 20.2	1 34 13.97	− 5.12	31 59 3.5	+38.8
	10	β Arietis . . .	9	48 28.17	− 0.10	− **32.79**	18 35 47.02	+ 4 40.55	+ 19.7	1 47 55.20	− 0.06	69 47 8.5	+ 1.3
	11	α Arietis . . .	9	0 51.93	− 0.08	− **32.75**	15 55 44.85	+ 4 21.76	+ 16.8	2 0 18.98	− 0.11	67 6 44.6	+ 3.5
	12	ξ^1 Ceti	9	7 6.51	− 0.28	− **32.89**	30 31 51.10	+ 4 40.28	+ 34.6	2 6 33.36	+ 0.10	81 43 27.2	+ 1.6
	13	Neptune . .	9	14 10.39	− 0.23	− 32.87	27 17 53.50	+ 4 53.76	+ 30.3	2 13 37.29	. .	78 29 38.8	. .
	14	B. A. C. 962 (R.) .	.	. . .	. .	. .	190 9 55.42	+ 5 18.19	+ 10.6	. . . .	. .	40 50 57.0	+30.9
	15	B. A. C. 962 . .	.	. . .	. .	. .	349 39 48.90	+ 5 1.04	− 10.6	. . . .	. .	40 51 0.5	+30.9
	16	ζ Arietis (R.) . .	.	. . .	. .	. .	161 37 49.62	+ 4 30.22	− 19.5	. . . .	. .	69 24 20.9	+ 2.2
	17	ζ Arietis . . .	.	. . .	. .	. .	18 13 54.50	+ 3 45.24	+ 19.5	. . . .	. .	69 24 20.4	+ 1.7
	18	Iris	9	13 53.97	− 0.12	− 32.88	18 9 48.08	+ 6 5.70	+ 19.5	3 13 20.97	. .	69 22 34.5	− 2.9
	19	Lal. (F.) 519 . .	5	27 20.57	+11.10	− 32.88	312 33 52.55	+ 5 3.72	− 1 4.1	3 26 58.79	−35.34	3 44 13.4	+29.6
	20	Thetis . . .	9	30 48.03	− 0.25	− 32.88	27 25 52 92	+ 6 47.11	+ 30.8	3 30 14.90	. .	78 39 32.0	− 2.0
	21	η Tauri . . .	9	40 48.59	− 0.07	− 32.88	15 6 . .	. . .	. .	3 40 15.64	− 0.06	. . . .	. .
	22	ζ Persei . . .	9	47 2.50	+ 0.05	− 32.88	7 17 50.42	+ 4 17.51	+ 7.7	3 46 29.67	− 0.03	58 28 36.8	+ 0.6
	23	γ^1 Eridani . . .	3	52 55.81	− 0.56	− 32.88	52 39 55.58	+ 3 44 32	+ 1 17.8	3 52 22.37	+ 0.41	103 51 18.9	+ 2.5
	24	Weisse 326 . .	9	17 54.83	− 0.36	− 32.88	36 3 50.20	+ 3 44.83	+ 43.3	4 17 21.59	− 4.82	87 14 39.5	+17.8
	25	Weisse 381 . .	9	20 13.99	− 0.39	− 32.88	38 1 50.30	+ 5 45.24	+ 46.6	4 19 40.72	− 4.78	89 14 43.3	+17.4
	26	Weisse 544 . .	9	27 49.54	− 0.39	− 32.89	38 1 50.30	+ 5 5.77	+ 46.6	4 27 16.26	− 4.80	89 14 3.9	+16.8
	27	Melpomene .	9	28 51.98	− 0.37	− 32.89	36 33 47.60	+ 5 51.47	+ 44.2	4 28 18.72	. .	87 46 44.5	− 5.2
	28	Schjellerup 1499	5	35 47.54	− 0.38	− 32.89	37 7 56.38	+ 5 1.16	+ 45.2	4 35 14.27	− 4.83	88 20 3.9	+16.2
	29	Weisse 902 . .	9	43 47.73	− 0.37	− 32.89	36 47 50.40	+ 5 40.20	+ 44.7	4 43 14.47	− 4.85	88 0 36.5	+15.6
	30	Schjellerup 1564	9	46 30.43	− 0.38	− 32.89	37 9 51.38	+ 4 16.93	+ 45.2	4 45 57.16	− 4.84	88 21 14.7	+15.3
	31	Weisse 1067 .	9	50 25.93	− 0.36	− 32.89	35 49 50.92	+ 4 5.63	+ 43.1	4 49 52.68	− 4.88	87 1 0.9	+15.1
	32	Lalande 9400 .	9	54 19.66	− 0.36	− 32.89	35 41 52.45	+ 4 46.07	+ 42.9	4 53 46.41	− 4.88	86 53 42.6	+14.7
	33	Lalande 9561 .	9	59 14.20	− 0.37	− 32.89	36 19 51.62	+ 4 24.26	+ 43.9	4 58 40.94	− 4.88	87 31 21.0	+14.2
	34	β Orionis . . .	9	9 15.74	− 0.50	− **32.98**	47 7 51.93	+ 5 13.13	+ 1 4.4	5 8 42.35	+ 0.09	98 20 30.7	+ 1.1
	35	ε Orionis . . .	9	30 36.49	− 0.41	− **32.94**	40 5 49.52	+ 3 43.97	+ 50.4	5 30 3.19	+ 0.05	91 16 45.1	+ 1.1
	36	Euphrosyne. .	4	52 30.20	+ 0.77	− 32.90	340 13 49.35	+ 6 18.22	− 21.4	5 51 58.07	. .	31 26 7.4	+ 1.9
	37	δ Ursæ Min., S. P.	5	12 1.38	−12.83	− 32.90	305 28 . .	. . .	. .	18 11 15.65	+ 0.05	. . . .	. .
	38	μ Geminorum. .	9	16 9.64	− 0.11	− **32.81**	16 13 47.50	+ 1 59.64	+ 17.6	6 15 36.63	− 0.11	67 25 25.9	+ 0.8
	39	Fides. . . .	9	26 2.20	− 0.02	− 32.90	9 59 46.70	+ 5 45.20	+ 10.7	6 25 29.28	. .	61 12 3.8	− 1.2
	40	Lydia (?) . . .	9	29 2.21	− 0.02	− 32.90	10 25 52.75	+ 6 5.40	+ 11.2	6 28 29.29	. .	61 38 30.6	− 0.9
	41	γ Geminorum . .	7	31 14.76	− 0.20	− **32.88**	22 17 49.52	+ 5 12.49	+ 24.7	6 30 41.64	− 0.05	73 29 47.9	+ 1.2
	42	α Canis Majoris .	9	40 21.46	− 0.62	− **32.88**	55 19 50.85	+ 5 14.78	+ 1 27 0	6 39 47.94	+ 0.03	106 32 53.8	+ 2.0
	43	51 Cephei . . .	5	43 35.62	+14.72	− 32.90	311 35 47.82	+ 5 5 47	− 1 7.4	6 43 17.44	+ 0.12	2 46 7.1	+ 0.2
	44	Proserpine . .	9	20 4.88	− 0.05	− 32.91	12 17 51.95	+ 6 18.71	+ 13.3	7 19 31.92	. .	63 30 45.2	. .
- 13	45	ε Bootis . . .	9	40 12.17	− 0.14	− **33.01**	11 13 49.85	+ 4 26.99	+ 12.1	14 39 38.96	− 0.05	62 24 50.1	+ 0.6
	46	β Ursæ Min. (R.) .	.	. . .	. .	. .	215 39 45.78	+ 4 48.68	+ 43.4	. . . .	. .	15 21 3.3	− 3.0
	47	β Ursæ Minoris .	3	51 33.06	+ 1.98	− 33.08	324 9 46.40	+ 5 41.15	− 43.4	14 51 1.96	− 0.03	15 21 5.4	− 0.9
	48	β Bootis . . .	9	57 53.22	+ 0.10	− **33.06**	357 55 48.68	+ 5 45.39	− 2.1	14 57 20.24	+ 0.01	49 7 53.2	+ 0.1
	49	β Libræ . . .	9	10 59.63	− 0.58	− **33.18**	47 43 48.98	+ 4 41 57	+ 1 6.4	15 10 25.96	+ 0.09	98 55 58.2	+ 1.9
	50	γ^2 Ursæ Minoris .	5	21 24.48	+ 1.66	− 33.09	326 33 49.50	+ 4 41.19	− 39.6	15 20 53.05	− 0.19	17 44 12.3	+ 0.6

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.08	50.5	51.2
30.11	51.5	51.8
30.14	51.0	51.0
30.17	47.5	44.2
30.16	44.8	40.2
30.18	41.8	36.5
30.36	40.5	39.0

For summary of the elements of reduction see page 3

16, 17. One bisection.
19, 43. Three bisections.
33. Four bisections.
6. Five bisections.

ZENITH-POINT CORR.

No. 1 to 44 + 55".46
No. 45 to 50 + 55.67

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
13	− 0.1	. .	. .	− 0.1

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ′	′ ″	h. m. s.	s.	° ′ ″	
Dec. 13	1	α Cor. Bor. . .	9	30 3.77	− 0.12	− **33.08**	11 41 46.48	+ 4 17.09	+ 12.5	15 29 30.56	0.00	62 52 37.3	+ 1
E. 14	2	Sun, N.	.	. . .	. .	. .	61 47 50.80	+ 3 43.91	+ 1 51.5	. . . .	. .	112 59 47.4	.
	3	Sun II, S. . .	9	30 42.64	− 0.72	− 31.15	62 19 48.20	+ 4 18.96	+ 1 54.0	17 30 10.77	−71.16	113 32 22.4	.
	4	δ Ursæ Minoris .	7	11 34.43	+12.23	− 31.16	312 14 . . .	. . .	. .	18 11 15.51	+ 0.21	. . . . .	.
	5	α Lyræ . . .	9	33 18.00	+ 0.19	− **31.16**	0 9 49.48	+ 3 35.48	+ 0.2	18 32 47.02	+ 0.02	51 19 46.4	− 0
	6	Mercury I, C. .	9	42 34.41	− 0.72	− 31.18	64 9 49.00	+ 4 24.36	+ 2 3.1	18 42 2.51	+ 0.20	115 22 37.7	.
	7	δ Aquilæ . . .	9	19 51.53	− 0.35	− **31.17**	35 55 48.38	+ 4 49.35	+ 43.3	19 19 19.99	+ 0.05	87 7 42.2	+ 1
	8	B. A. C. 6734 .	9	33 39.12	+ 0.49	− 31.20	348 53 50.88	+ 3 35.23	− 11.6	19 33 8.41	+ 0.22	40 3 35.7	+11
	9	γ Aquilæ . . .	9	40 58.20	− 0.24	− **31.20**	28 29 45.50	+ 4 20.77	+ 32.4	19 40 26.76	+ 0.03	79 40 59.9	+ 0
	10	α^2 Capricorni . .	9	11 48 30	− 0.52	− **31.25**	51 43 48.78	+ 3 59.86	+ 1 15.4	20 11 16.56	+ 0.09	102 55 25.2	+ 1
	11	Venus I, S. . .	9	53 48.30	− 0.61	− 31.23	58 29 49.40	+ 4 57.86	+ 1 36.8	20 53 16.46	+ 0.94	109 42 45.3	.
	12	α Pegasi . . .	9	59 12.49	− 0.23	− **31.11**	24 15 43.82	+ 4 25.18	+ 27.0	22 58 41.10	− 0.03	75 26 57.2	+ 2.
	13	Weisse 1249 .	9	1 6.89	− 0.58	− 31.16	52 11 45.18	+ 3 48.41	+ 1 17.1	23 0 35.15	− 3.49	103 23 11.9	+16.
	14	Weisse 57^1 . .	5	6 8.55	− 0.57	− 31.16	51 23 46.35	+ 4 21.87	+ 1 15.0	23 5 36.82	− 3.50	102 35 44.4	+17.
	15	Weisse 57^2 . .	5	6 8.98	− 0.57	− 31.16	51 23 46.35	+ 4 22.14	+ 1 15.0	23 5 37.25	− 3.50	102 35 44.7	+17.
	16	Weisse 185 . .	9	11 50.04	− 0.56	+ 31.16	51 11 46.25	+ 3 26.19	+ 1 14.4	23 11 18.32	− 3.52	102 22 48.0	+17.
	17	θ Piscium . . .	9	22 18.61	− 0.34	− **31.18**	33 5 47.50	+ 4 34.74	+ 39.1	23 21 47.12	+ 0.08	84 17 22.5	+ 1.
	18	λ Draconis, S. P. .	9	24 44.44	− 3.28	− 31.15	288 51 48.25	+ 4 39.55	− 2 52.9	11 24 10.01	− 0.42	339 59 56.1	+ 3.
	19	ι Piscium . . .	9	34 12.44	− 0.35	− **31.16**	33 49 47.48	+ 5 11.67	+ 40.3	23 33 40.94	− 0.02	85 2 0.7	+ 3.
	20	B. A. C. 8245 .	9	36 45.37	+ 0.28	− 31.15	354 31 46.35	+ 2 44.79	− 5.7	23 36 14.50	− 2.90	45 40 46.6	+36.
	21	Anonymous .	9	43 53.49	− 0.58	− 31.14	51 49 47.18	+ 3 59.82	+ 1 16.3	23 43 21.77	− 3.68	103 1 24.5	+18.
	22	Durch. 70°, 1340	8	55 1 58	+ 1.66	− 31.14	327 59 50.45	+ 2 50.88	− 37.4	23 54 32.10	− 2.40	19 8 25.1	+42.
	23	Σ 3052^1 . . .	9	57 10.28	+ 1.66	− 31.14	328 7 49.65	+ 5 18.32	− 37.2	23 56 40.80	− 2.49	19 18 52.0	+42.
	24	Σ 3052^2 . . .	9	57 11.24	+ 1.66	− 31.14	328 7 49.65	+ 4 45.86	− 37.2	23 56 41.76	− 2.49	19 18 19.5	+42.
	25	γ Pegasi . . .	9	7 29.17	− 0.24	− **31.14**	24 17 47.52	+ 4 56.29	+ 27.2	0 6 57.80	+ 0.02	75 29 32.2	+ 0.
	26	B. A. C. 79 (R.) .	.	. . .	. .	. .	192 21 44.95	+ 5 19.19	+ 13.3	. . . .	. .	38 39 3.8	+39.
	27	B. A. C. 79 . .	.	. . .	. .	. .	347 27 48.95	+ 5 7.30	− 13.3	. . . .	. .	38 39 4.1	+39.
	28	32^1 Camelop., S. P. .	9	48 46.52	− 7.46	− 31.11	302 55 47.80	+ 3 53.79	− 1 32.5	12 48 7.95	− 0.72	354 4 30.3	+43.
	29	32^2 Camelop., S. P. .	9	48 54.48	− 7.46	− 31.11	302 55 47.80	+ 3 35.95	− 1 32.5	12 48 15.91	+ 0.70	354 4 12.5	+ 3.
	30	Moon I, S. . .	9	54 1.92	− 0.31	− 31.11	29 17 47.50	+ 5 28.34	+ 33.9	0 53 30.50	+63.11	80 30 10.9	. .
	31	B. A. C. 345. .	9	4 55.14	− 0.01	− 31.11	8 3 47.28	+ 2 55.91	+ 8 6	1 4 24.02	− 4.08	59 13 10.0	+34.
	32	Polaris . . .	7	14 10.66	+30.62	− 31.10	310 9 48.80	+ 5 8.74	− 1 11.1	1 14 10.18	− 1.28	1 20 7.6	+ 1.
	33	Weisse 791^1. .	4	46 6.28	− 0.30	− 31.09	28 35 46.35	+ 4 44.67	+ 33.0	1 45 34.89	− 4.29	79 47 25.2	+27.
	34	Weisse 791^2. .	5	46 6.40	− 0.30	− 31.09	28 35 46.35	+ 4 41.54	+ 33.0	1 45 35.01	− 4.29	79 47 22.1	+27.
	35	B. A. C. 587. .	9	50 53.21	+ 0.31	− 31.09	352 19 47.00	+ 3 43.95	− 8.1	1 50 22.43	− 4.90	43 29 44.1	+36.
	36	B. A. C. 646. .	9	0 42.07	+ 0.70	− 31.08	340 59 48.22	+ 3 20.53	− 20.8	2 0 11.69	− 5.58	32 9 9.2	+37.
	37	Piazzi II, 10. .	9	5 22.27	− 1.05	− 31.08	80 9 48.05	+ 4 49.38	+ 5 39.3	2 4 50.14	− 4.26	131 26 37.9	+13.
	38	Neptune . .	9	13 56.54	− 0.30	− 31.07	27 19 50.25	+ 3 48.25	+ 31.3	2 13 25.17	. .	78 30 31.0	. .
	39	O. Arg. N. 3176.	5	43 13.99	+ 3.54	− 31.06	319 3 47.20	+ 5 6.52	− 52.4	2 42 46.47	−12.62	10 14 22.5	+35.
	40	Anonymous. .	9	51 21 92	+ 0.17	− 31.06	17 45 45.15	+ 3 48.81	+ 19.5	2 50 50.69	− 4.86	68 56 14.7	+27.
	41	O. Arg. N. 3326.	6	53 14.70	+ 3.54	− 31.06	319 3 49.50	+ 1 28.37	− 52.5	2 52 47.18	−13.25	10 10 46.6	+14.
	42	Iris	9	13 6.80	− 0.18	− 31.05	18 29 50.98	+ 6 2.39	+ 20.4	3 12 35.57	. .	69 42 35.0	− 2.
	43	Taylor 1244 . .	5	15 7.73	− 1.10	− 31.05	82 13 47.00	+ 4 57.92	+ 7 5.7	3 14 35.58	− 4.24	133 32 11.8	+12.
	44	B. A. C. 1125 .	9	33 17.42	− 1.04	− 31.04	79 27 48.75	+ 1 2.36	+ 5 17.5	3 32 45.34	− 4.24	130 40 29.8	+13.
	45	B. A. C. 1136^1 .	5	35 57.84	− 1.04	− 31.04	79 27 48.75	+ 5 14.00	+ 5 19.6	3 35 25.76	− 4.23	130 44 43.6	+13.
	46	B. A. C. 1136^2 .	5	35 58.17	− 1.04	− 31.04	79 27 48.75	+ 5 22.22	+ 5 19.6	3 35 26.09	− 4.23	130 44 51.8	+13.
	47	η Tauri . . .	9	40 46.86	− 0.13	− **31.01**	15 5 48.75	+ 3 46.32	+ 16.5	3 40 15.69	− 0.02	66 16 12.8	+ 0.
	48	ζ Persei . . .	9	47 0.73	− 0.01	− **30.99**	7 17 45.72	+ 4 20.40	+ 7.9	3 46 29.69	− 0.02	58 28 35.2	− 0.
	49	γ^1 Eridani . . .	9	52 53.69	− 0.61	− **31.08**	52 39 49.12	+ 3 47.81	+ 1 19.8	3 52 22.05	+ 0.08	103 51 17.9	+ 1.
	50	B. A. C. 5352, S.P.	5	56 40.78	− 6.52	− 31.03	302 9 44.42	+ 4 1.59	− 1 36.3	15 56 3.23	+16.17	353 18 30.9	+26.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
2	30.38	42.8	43.0
11	30.36	48.0	47.5
12	30.34	43.5	43.0

For summary of the elements of reduction see page 3.

39. One bisection.
32. Three bisections.
1, 6, 11. Four bisections.
30. Five bisections.

ZENITH-POINT CORR.

No. 1 to 11 + 55″.67
No. 12 to 50 + 55.40

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	″	′ ″
2	− 7.9	+ 16 17.5	. .	+ 16 9.6
3	− 8.0	− 16 17.5	. .	− 16 25.5
6	− 6.5	. .	. .	− 6.5
11	− 11.6	− 13.2	. .	− 24.8
30	−26 51.6	− 15 2.8	. .	− 41 54
38	− 0.1	. .	. .	− 0

ATE ND S'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
177.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
C. 14	1	B. A. C. 1287	9	6 29.64	+ 0.35	− 31.02	350 43 46.48	+ 3 57.74	− 9.9	4 5 58.07	− 6.63	41 53 55.5	+23.5
E.	2	γ Tauri (R.)	.	. . .	. .	. .	156 21 44.92	+ 5 6.74	− 26.6	. . . .	. .	74 39 56.1	+ 0.7
	3	γ Tauri	.	. . .	. .	. .	23 27 45.70	+ 5 22.28	+ 26.6	. . . .	. .	74 39 55.8	+ 0.4
	4	Weisse 340	9	18 38.36	− 0.41	− 31.02	36 35 43.75	+ 4 27.39	+ 45.4	4 18 6.93	− 4.83	87 47 17.7	+17.4
	5	Lalande 8437	9	23 2.18	− 0.41	− 31.02	36 41 50.50	+ 4 47.76	+ 45.6	4 22 30.75	− 4.84	87 53 45.1	+17.0
	6	Melpomene	9	26 15.59	− 0.41	− 31.01	36 21 48.95	+ 4 53.40	+ 45.0	4 25 44.17	. .	87 33 48.6	− 5.1
	7	Weisse 632	9	31 14.98	− 0.41	− 31.01	36 29 51.60	+ 3 2.35	+ 45.2	4 30 43.56	− 4.86	87 40 0.4	+16.3
	8	Weisse 727	9	35 9.67	− 0.41	− 31.01	36 29 51.60	+ 6 34.26	+ 45.3	4 34 38.25	− 4.86	87 43 32.4	+16.0
	9	Weisse 817	9	39 31.39	− 0.41	− 31.01	36 23 49.18	+ 4 16.36	+ 45.1	4 38 59.97	− 4.87	87 35 11.8	+15.6
F.	10	δ Ophiuchi	9	8 28.01	− 0.54	− **31.11**	42 9 54.05	+ 5 35.46	+ 54.6	16 7 56.35	+ 0.01	93 22 45.3	− 3.1
	11	τ Herculis	9	16 34.03	+ 0.39	− 31.12	352 11 49.45	+ 5 50.90	− 8.1	16 16 3.30	+ 0.38	43 23 54.5	− 1.7
	12	α Scorpii	7	22 26.76	− 0.90	− **31.13**	64 55 44.72	+ 5 19.20	+ 2 8.0	16 21 54.74	− 0.01	116 9 33.1	− 4.4
15	13	Sun I, N.	9	32 46.33	− 0.82	− 31.12	61 49 51.38	+ 4 43.44	+ 1 50.9	17 32 14.39	+61.17	113 2 46.9	. .
	14	Sun II, S.	9	35 8.68	− 0.82	− 31.12	62 21 53.58	+ 5 13.00	+ 1 53.5	17 34 36.74	−61.18	113 35 21.3	. .
	15	α Lyræ	9	33 17.89	+ 0.21	− **31.07**	0 9 57.55	+ 3 25.62	+ 0.2	18 32 46.97	− 0.03	51 19 44.6	− 2.2
	16	β Lyræ	9	46 4.33	+ 0.09	− **31.16**	5 35 51.45	+ 4 24.45	+ 5.9	18 45 33.29	+ 0.07	56 46 43.0	+ 0.2
	17	ζ Aquilæ	5	0 18.62	− 0.26	− **31.13**	25 7 54.10	+ 4 20.67	+ 27.7	18 59 47.23	+ 0.11	76 19 3.7	+ 1.6
	18	α Aquilæ	9	45 20.44	− 0.33	− **31.05**	30 15 52.50	+ 4 23.24	+ 34.3	19 44 48.98	− 0.04	81 27 11.2	− 0.3
	19	α Cygni	9	37 45.81	+ 0.41	− **31.18**	353 57 46.25	+ 5 8.76	− 6.1	20 37 15.09	+ 0.09	45 9 10.1	− 0.5
	20	ν Cygni	9	53 7.30	+ 0.29	− **31.21**	358 7 50.75	+ 3 47.75	− 1.8	20 52 36.46	+ 0.12	49 17 57.9	+ 0.4
	21	Venus I, S.	9	57 46.42	− 0.73	− 31.13	58 10 0.45	+ 4 34.97	+ 1 34.1	20 57 14.56	+ 0.94	109 22 30.7	. .
	22	Venus, N.	.	. . .	. .	. .	58 10 0.45	+ 4 7.94	+ 1 34.1	. . . .	. .	109 22 3.7	. .
	23	ζ Cygni	9	8 14.93	+ 0.04	− **31.10**	9 5 50.88	+ 3 52.42	+ 9.4	21 7 43.84	0.00	60 16 13.9	− 1.3
	24	Weisse 1261	9	1 33.24	− 0.68	− 31.18	51 15 50.25	+ 4 34.81	+ 1 13.7	23 1 1.38	− 3.47	102 28 0.0	+16.8
	25	Weisse 49	9	5 39.26	− 0.66	− 31.18	49 57 49.52	+ 4 56.47	+ 1 10.4	23 5 7.42	− 3.47	101 10 17.6	+17.5
	26	ι Piscium	9	34 12.44	− 0.44	− **31.08**	33 49 48.90	+ 5 12.38	+ 30.8	23 33 40.83	− 0.12	85 2 2.3	+ 2.3
	27	B. A. C. 8245	7	36 45.35	+ 0.28	− 31.17	354 31 47.35	+ 2 45.25	− 5.6	23 36 11.46	− 2.88	45 40 48.2	+36.9
	28	ω Piscium	9	53 34.88	− 0.42	− **31.16**	32 37 51.18	+ 3 48.67	+ 38.0	23 53 3.29	− 0.01	83 48 39.0	+ 1.8
	29	Weisse 1114	5	56 6.60	− 0.56	− 31.17	42 31 51.40	+ 3 14.87	+ 54.4	23 55 34.87	− 3.64	93 42 21.9	+22.3
	30	B. A. C. 5	9	3 0.36	− 0.55	− 31.17	41 41 48.65	+ 5 1.78	+ 52 8	0 2 28.64	− 3.68	92 54 4.4	+22.8
	31	Lamont 18	9	6 57.26	− 0.54	− 31.17	40 39 50.95	+ 7 15.62	+ 51.0	0 6 25.55	− 3.69	91 54 18.8	+23.2
	32	Weisse (2) 296	9	12 47.66	− 0.03	− 31.17	7 57 48.82	+ 5 4.72	+ 8.4	0 12 16.46	− 3.51	59 9 23.1	+34.3
	33	Lalande 512	9	19 41.22	− 0.49	− 31.17	37 33 51.12	+ 3 6.75	+ 45.6	0 19 9.56	− 3.74	88 44 4.7	+24.7
	34	B. A. C. 123	9	25 59.90	+ 0.58	− 31.17	345 41 49 90	+ 3 16.80	− 15.0	0 25 29.29	− 3.57	36 51 12.9	+40.0
	35	B. A. C. 136¹	5	28 18.26	− 1.06	− 31.17	74 25 53.10	+ 3 53.33	+ 3 30.4	0 27 46.03	− 4.07	125 39 38.0	+12.6
	36	B. A. C. 136²	5	28 18.39	− 1.06	− 31.17	74 25 53.10	+ 3 59.21	+ 3 30.4	0 27 46.16	− 4.07	125 39 43.9	+12.6
	37	β Ceti	6	38 0.89	− 0.77	− **31.27**	57 27 47.40	+ 3 44.55	+ 1 32.8	0 37 28.95	+ 0.16	108 39 26.0	+ 1.3
	38	ε Piscium	9	57 9.16	− 0.41	− **31.17**	31 33 44.82	+ 5 12.48	+ 36.5	0 56 37.58	− 0.01	82 45 55.0	+ 1.5
	39	Polaris	5	14 6.28	+35.29	− 31.17	310 9 53.75	+ 5 0.95	− 1 9.9	1 14 10.40	− 0.37	1 20 6.0	+ 0.5
	40	θ¹ Ceti	9	18 28.42	− 0.63	− **31 19**	47 37 50.08	+ 3 29.48	+ 1 5.0	1 17 56.62	+ 0.02	98 48 45.8	+ 2.0
	41	η Piscium	9	25 29.81	− 0.30	− **31.14**	24 5 50.20	+ 4 13.78	+ 26.6	1 24 58.35	+ 0.06	75 16 51.8	+ 2.4
	42	B. A. C. 495	5	33 13.28	− 0.28	− 31.16	22 47 44.78	+ 4 58.76	+ 25.0	1 32 41.84	− 4.23	73 59 29.7	+29.6
	43	B. A. C. 508¹	7	34 44.30	+ 0.80	− 31.16	340 49 50.42	+ 3 12.13	− 20.5	1 34 13.94	− 5.04	31 59 3.3	+39.4
	44	Moon S.	.	. . .	. .	. .	23 55 45.92	+ 3 25.01	+ 26.4	. . . .	. .	75 5 58.5	. .
	45	B. A. C. 609	9	53 26.84	− 0.36	− 31.16	27 5 51.62	+ 4 59.75	+ 30.4	1 52 55.32	− 4.34	78 17 43.0	+27.8
E. 17	46	β Libræ	9	10 57.97	− 0.50	− **31.49**	47 43 51.88	+ 4 39.22	+ 1 6.4	15 10 25.95	− 0.03	98 55 58.7	+ 1.8
	47	μ¹ Bootis	9	20 23.42	+ 0.11	− **31.40**	0 59 44.15	+ 5 46.84	+ 1.1	15 19 52.01	− 0.16	52 11 53.3	+ 0.6
	48	α Serpentis	5	38 46.79	− 0.31	− **31.58**	31 59 46.38	+ 4 44.66	+ 37.7	15 38 14.96	+ 0.09	83 11 29.9	+ 0.9
	49	ε Serpentis	9	45 15.37	− 0.33	− **31.61**	33 57 52.80	+ 4 28.12	+ 40.6	15 44 43.52	+ 0.08	85 9 22.7	+ 1.8
	50	β Herculis (R.)	.	. . .	. .	. .	162 47 48.58	+ 4 4.36	− 18.5	. . . .	. .	68 14 46.8	−18.0

Barom.	At. Ther.	Ex. Ther.
in.	°	°
30.30	36.5	32.5
30.21	38.5	38.4
30.17	42.6	43.4
30.15	49.5	48.0
30.15	51.5	49.8
30.15	52.0	51.5
30.11	48.0	45.3
30.10	46.6	43.6
30.09	45.8	43.6
30.47	43.8	41.8

For summary of the elements of reduction see page 3.

10, 12. One bisection.
44. Four bisections.
39. Five bisections.

ZENITH-POINT CORR.

	″
No. 1 to 9	+ 55.40
No. 10 to 23	+ 52.61
No. 24 to 45	+ 55.00
No. 46 to 50	+ 55.80

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
13	− 7.9	+ 16 17.2	. .	+ 16 9.3
14	− 8.0	− 16 17.2	. .	− 16 25.2
21	− 11.7	− 13.7	. .	− 25.4
22	− 11.7	+ 13.7	− 0.4	+ 1.6
44	−22 28.0	− 15 13.0	. .	− 37 41.0

DATE AND OBS'R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS. Inst.	CORRECTIONS. Clock.	ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS. Instrument.	CORRECTIONS. Refraction.	APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous
1877.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	
Dec. 17	1	β Herculis. . .	.	. . .	. .	. .	17 3 47.32	+ 4 19.05	+ 18.5	. . . .	. .	68 14 46.1	−18
E.	2	B. A. C. 5664 .	9	38 11.61	+ 0.03	− 31.51	6 59 49.35	+ 4 23.86	+ 7.4	16 37 40.13	− 1.22	58 10 41.8	−17
	3	B. A. C. 5731 .	4	56 7.61	+ 0.02	− 31.51	7 41 50.90	+ 5 23.55	+ 8.2	16 55 36.12	− 1.18	58 53 43.8	−15
18	4	Sun I, S.. . .	9	46 4.56	− 0.65	− 31.50	62 29 49.88	+ 3 38.50	+ 1 54.7	17 45 32.41	+70.28	113 41 44.3	.
	5	Sun II, N. . .	9	48 27.12	− 0.65	− 31.50	61 57 49.38	+ 3 5.13	+ 1 52.0	17 47 52.97	−70.28	113 9 7.7	.
	6	δ Ursæ Minoris .	4	11 34.82	+11.27	− 31.50	312 14	. . .	. .	18 11 14.59	− 0.22	. . . .	.
	7	α Lyræ . . .	9	33 18.33	+ 0.15	− **31.44**	0 9 47.18	+ 3 38.02	+ 0.2	18 32 46.98	− 0.03	51 19 46.6	− 1.
	8	δ Draconis . .	9	12 58.01	+ 1.23	− 31.49	321 23 51.00	+ 3 30.17	− 32.6	19 12 27.75	+ 0.05	22 33 9.8	− 0.
	9	δ Aquilæ . . .	9	19 51.93	− 0.34	− **31.57**	35 55 51.18	+ 4 47.28	+ 43.5	19 19 20.10	+ 0.15	87 7 43.2	+ 2.
	10	B. A. C. 6690 .	9	26 18.49	− 0.03	− 31.49	11 7 52.02	+ 3 20.74	+ 11.8	19 25 46.97	− 1.30	62 17 45.8	+ 6.
	11	B. A. C. 6734 .	9	33 39.40	+ 0.41	− 31.40	348 53 47.75	+ 3 38.99	− 11.7	19 33 8.32	+ 0.26	40 3 36.2	+ 9.
	12	γ Aquilæ . . .	9	40 58.51	− 0.26	− **31.49**	28 29 50.35	+ 4 17.51	+ 32.6	19 40 26.76	+ 0.03	79 41 1.7	+ 1.
	13	α Aquilæ . . .	9	45 20.81	− 0.28	− **31.47**	30 15 47.32	+ 4 29.79	+ 35.0	19 44 49.04	+ 0.02	81 27 13.3	+ 1.
	14	α Cygni (R.) . .	.	. . .	. .	. .	185 51 48.32	+ 5 16.71	+ 6.2	. . . .	. .	45 9 10.0	− 1.
	15	α Cygni . . .	.	. . .	. .	. .	353 57 51.05	+ 5 6.15	− 6.2	. . . .	. .	45 9 12.2	+ 1.
	16	Venus I, S. . .	9	9 22.01	− 0.59	− 31.48	57 7 49.88	+ 4 12.46	+ 1 32.8	21 8 49.94	+ 0.97	108 19 56.3	.
	17	ι Cassiopeæ . .	9	19 34 43	+ 1.12	− 31.44	331 57 51.28	+ 4 50.26	− 32.2	2 19 4.11	+ 0.27	23 8 30.5	− 0.
	18	B. A. C. 777. .	9	27 0.39	+ 1.64	− 31.44	326 31 48.80	+ 5 10.34	− 40.0	2 26 30.59	− 8.08	17 42 40.3	+38.
	19	Lalande 4803 .	9	29 56.63	− 0.34	− 31.45	32 29 48.25	+ 4 51.33	+ 38.8	2 29 24.84	− 4.49	83 41 39.6	+24.
	20	γ Ceti	9	37 31.99	− 0.38	− **31.45**	36 5 52.15	+ 3 40.58	+ 44.3	2 37 0.16	− 0.01	87 16 38.2	+ 1.
	21	B. A. C. 872. .	9	43 21.23	− 0.08	− 31.45	12 3 49.38	+ 3 59.60	+ 13.0	2 42 49.70	− 4.92	63 14 23.2	+29.
	22	β Ursæ Min., S. P.	9	51 36.83	− 2.84	− 31.46	293 29 50.35	+ 5 2.21	− 2 18.1	14 51 2.53	+ 0.30	344 38 55.7	+ 3.
	23	α Ceti	9	56 27.49	− 0.37	− **31.49**	35 11 45.18	+ 4 27.21	+ 42.9	2 55 55.66	+ 0.04	86 23 16.5	+ 0.
	24	ζ Arietis . . .	9	8 26.57	− 0.16	− **31.43**	18 13 48.35	+ 3 50.02	+ 20.0	3 7 54.94	− 0.04	69 24 19.6	+ 0.
	25	δ Persei (R.) . .	.	. . .	. .	. .	188 25 47.00	+ 4 25.91	+ 9.1	. . . .	. .	42 35 59.2	− 1.
	26	δ Persei . . .	.	. . .	. .	. .	351 25 49.92	+ 3 57.99	− 9.1	. . . .	. .	42 36 0.0	− 0.
	27	η Tauri (R.) . .	.	. . .	. .	. .	164 45 46.10	+ 4 39.57	− 16.4	. . . .	. .	66 16 11.9	− 0.
	28	η Tauri . . .	.	. . .	. .	. .	15 5 47.42	+ 3 48.62	+ 16.4	. . . .	. .	66 16 13.6	+ 1.
	29	ζ Ursæ Min., S. P.	9	48 57.48	− 3.58	− 31.48	297 1 49.28	+ 3 39.41	− 1 58.1	15 48 22.42	+ 0.20	348 9 51.8	+ 1.
	30	α Tauri . . .	9	29 28.88	− 0.22	− **31.59**	22 34	. . .	. .	4 28 57.16	+ 0.08	. . . .	.
	31	Moon I, N. . .	5	30 9.55	− 0.08	− 31.50	11 55 49.58	+ 4 34.19	+ 12.9	4 29 37.97	+74.16	63 6 57.9	.
	32	ι Aurigæ . . .	9	49 36.50	+ 0.01	− **31.45**	5 49 48.92	+ 5 17.15	+ 6.3	4 49 5.00	− 0.08	57 1 33.6	+ 0.
	33	β Orionis . . .	9	9 14.32	− 0.50	− **31.50**	47 8	. . .	. .	5 8 42.30	− 0.02	. . . .	.
F. 19	34	γ¹ Eridani . . .	9	52 54.20	− 0.58	− **31.62**	52 39 53.88	+ 3 44.82	+ 1 18.5	3 52 22.10	+ 0.13	103 51 18.4	+ 0.
	35	γ Tauri . . .	9	13 24.56	− 0.21	− **31.47**	23 27 51.70	+ 5 18.67	+ 26.1	4 12 52.82	− 0.04	74 39 57.7	+ 2.
	36	Weisse 340 . .	5	18 38.70	− 0.38	− 31.53	36 35 50.48	+ 4 23.14	+ 44.6	4 18 6.79	− 4.85	87 47 19.4	+16.
	37	ε Tauri . . .	9	22 3.09	− 0.16	− **31.49**	19 53 52.25	+ 4 46.03	+ 21.8	4 21 31.40	− 0.03	71 5 21.3	+ 2.
	38	Lalande 8437 .	2	23 2.74	− 0.38	− 31.53	36 41 56.60	+ 4 44.42	+ 44.8	4 22 30.83	− 4.86	87 53 47.1	+16.
	39	Lalande 8824² .	7	35 12.74	− 0.40	− 31.53	38 3 46.55	+ 5 30.10	+ 47.2	4 34 40.81	− 4.86	89 16 25.0	+15.
	40	Weisse 777 . .	6	37 16.50	− 0.39	− 31.53	37 55 52.50	+ 4 20.83	+ 46.9	4 36 44.58	− 4.86	89 7 21.4	+15.
	41	Weisse 936 . .	9	45 1.31	− 0.39	− 31.53	37 51 54.60	+ 4 35.70	+ 46.8	4 44 29.39	− 4.88	89 3 38.3	+14.
	42	Lalande 9270 .	9	50 24.37	− 0.38	− 31.54	36 57 56.82	+ 3 56.85	+ 45.3	4 49 52.45	− 4.91	88 9 0.2	+14.
	43	Lalande 9400 .	7	54 18.30	− 0.36	− 31.54	35 41 48.02	+ 4 50.79	+ 43.3	4 53 46.40	− 4.95	86 53 43.3	+13.
	44	Weisse 1223 .	9	56 39.63	− 0.38	− 31.54	36 57 45.90	+ 2 50.71	+ 45.3	4 56 7.71	− 4.92	88 7 43.1	+13.
	45	ε Ursæ Min., S. P.	5	58 59.17	− 5.85	− 31.54	301 5 45.70	+ 3 28.16	− 1 39.2	16 58 21.78	− 0.09	352 13 55.9	+ 1.
	46	β Orionis . . .	9	9 14.36	− 0.51	− **31.52**	47 7 53.60	+ 5 13.73	+ 1 5.0	5 8 42.31	− 0.02	98 20 33.5	+ 2.
	47	ε Orionis . . .	9	30 35.18	− 0.42	− **31.52**	40 5 49.88	+ 3 44.01	+ 50.8	5 30 3.22	− 0.02	91 16 45.9	+ 0.
	48	Moon I, N. . .	9	35 3.30	− 0.04	− 31.55	11 1 51.38	+ 3 26.16	+ 11.8	5 34 31.71	+75.82	62 11 50.5	.
	49	α Orionis . . .	9	49 7.76	− 0.32	− **31.54**	31 25 50.70	+ 4 7.53	+ 36.9	5 48 35.89	− 0.03	82 36 56.3	+ 1.
	50	δ Ursæ Min., S. P.	5	11 58.02	−12.83	− 31.55	305 27 54.95	+ 3 35.71	− 1 24.2	18 11 13.64	− 0.96	356 36 27.7	+ 2.

No.	Barom.	At. Ther.	Ex. Ther.
	in.	°	°
5	30.48	47.2	45.5
16	30.50	46.5	44.5
17	30.52	41.5	39.0
31	30.52	41.2	38.8
34	30.28	44.2	41.4
46	30.26	41.8	38.6

For summary of the elements of reduction see page 3.

31, 45, 48. Three bisections.
11, 13, 16. Four bisections.
50. Five bisections.

ZENITH-POINT CORR.

No. 1 to 16 + 55.″80
No. 17 to 32 + 56.42
No. 34 to 50 + 56.01

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
4	− 8.0	− 16 18.3	. .	− 16 26.
5	− 7.9	+ 16 18.3	. .	+ 16 10.
16	− 12.0	− 13.8	. .	− 25
31	−11 52.8	+ 15 50.9	. .	+ 3 58.
48	−11 6.1	+ 16 2.6	. .	+ 4 56.

E R.	Number.	OBJECT.	Threads.	MEAN THREAD.	CORRECTIONS.		ZENITH DIST. SOUTH, FROM CIRCLES.	CORRECTIONS.		APPARENT RIGHT ASCENSION.	Miscellaneous Correction.	APPARENT NORTH-POLAR DISTANCE.	Miscellaneous Correction.
					Inst.	Clock.		Instrument.	Refraction.				
r.				m. s.	s.	s.	° ′ ″	′ ″	′ ″	h. m. s.	s.	° ′ ″	″
19	1	Fides . . .	1	17 53.88	− 0.02	− 31.55	9 49 55.10	+ 5 51.60	+ 10.5	6 17 22.31	. .	61 2 18.4	− 1.2
	2	51 Cephei . . .	5	43 35.38	+14.73	− 31.56	311 35 50.90	+ 4 59.25	− 1 7.6	6 43 18.55	− 0.63	2 46 3.8	− 1.0
	3	ε Canis Majoris .	9	54 24.03	− 0.80	− **31.51**	67 35 53.78	+ 3 35.95	+ 2 25.6	6 53 51.67	− 0.10	118 48 16.5	− 0.4
	4	δ Canis Majoris .	9	4 0.07	− 0.76	− **31.67**	64 59 52.30	+ 3 32.50	+ 2 9.0	7 3 27.75	+ 0.06	116 11 55.0	+ 3.1
30	5	α Lyræ. . . .	9	33 19.44	− 0.01	. .	0 10 . .	. . . .	. .	. . . . .	. .	. . . .	. .
31	6	β Arietis . . .	9	48 38.01	− 0.43	− **32.46**	18 36 . .	. . . .	. .	1 47 55.13	+ 0.03	. . . .	. .
	7	α Arietis . . .	9	0 51.80	− 0.38	− **32.48**	15 56 . .	. . . .	. .	2 0 18.97	+ 0.04	. . . .	. .
	8	ξ¹ Ceti	9	7 6.41	− 0.68	− **32.52**	30 32 . .	. . . .	. .	2 6 33.28	+ 0.15	. . . .	. .
	9	γ Ceti	9	37 33.43	− 0.99	− **32.34**	36 6 . .	. . . .	. .	2 37 0.11	0.00	. . . .	. .
	10	α Ceti	9	56 28.92	− 0.97	− **32.38**	35 12 . .	. . . .	. .	2 55 55.62	+ 0.06	. . . .	. .
	11	ζ Arietis . . .	9	8 27.88	− 0.55	− **32.41**	18 14 . .	. . . .	. .	3 7 55.00	+ 0.08	. . . .	. .
	12	α Persei . . .	9	16 10.97	+ 0.44	− **32.38**	349 24 . .	. . . .	. .	3 15 38.97	+ 0.02	. . . .	. .
	13	γ² Ursæ Min., S P.	9	21 31.03	− 4.26	− 32.44	291 8 . .	. . . .	. .	15 20 54.33	− 0.27	. . . .	. .
	14	δ Persei . . .	9	34 48.74	+ 0.38	− **32.50**	351 26 . .	. . . .	. .	3 34 16.68	+ 0.23	. . . .	. .
	15	η Tauri . . .	9	40 48.47	− 0.36	− **32.40**	15 6 . .	. . . .	. .	3 40 15.67	− 0.03	. . . .	. .
	16	ζ Persei . . .	9	47 2.24	− 0.22	− **32.30**	7 18 . .	. . . .	. .	3 46 29.69	− 0.01	. . . .	. .
	17	γ¹ Eridani . . .	9	52 55.62	− 1.11	− **32.54**	52 40 . .	. . . .	. .	3 52 22.07	+ 0.13	. . . .	. .
	18	γ Tauri . . .	9	13 25.91	− 0.68	− **32.34**	23 28 . .	. . . .	. .	4 12 52.90	+ 0.03	. . . .	. .
	19	ε Tauri . . .	9	22 4.33	− 0.47	− **32.39**	19 54 . .	. . . .	. .	4 21 31.42	− 0.04	. . . .	. .

Barom.	At. Ther.	Ex. Ther.	*For summary of the elements of reduction see page 3.*	No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
in.	°	°			′ ″	′ ″	′ ″	° ′ ″
30.27	41.8	37.8						

ZENITH-POINT CORR.

No. 1 to 4 + 56″.01

1. One bisection.
2. Five bisections.

OBSERVATIONS

WITH THE

ERIDIAN TRANSIT INSTRUMENT.

1877.

OBSERVATIONS

WITH THE

MERIDIAN TRANSIT INSTRUMENT.

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	s.	s.	h. m. s.	s.
Jan. 5	ω Piscium	1	4.5	6.1	8.5	20.6	22.0	23.8	25.5	27.0	38.9	41.4	43.0	53 23.75	+ 0.07	−24.17	23 52 59.65	+ 0.06
Y.	γ Pegasi	2	58.4	0.0	2.6	15.0	16.6	18.4	20.0	21.6	33.6	36.4	37.9	7 18.23	0.11	24.17	0 6 54.17	0.08
	σ Andromedæ	3	54.1	56.0	59.0	13.9	15.7	17.7	19.7	21.6	36.6	39.6	41.7	12 17.78	0.24	24.17	0 11 53.85	0.35
	B. A. C. 83	4	19.5	21.9	26.1	45.9	48.2	50.9	53.7	56.0	15.7	19.6	22.6	18 50.92	0.39	24.17	0 18 27.14	0.70
	48 Piscium	5	53.6	55.1	57.9	10.3	11.8	13.5	15.5	16.8	29.3	31.8	33.6	22 13.56	0.11	24.17	0 21 49.50	0.00
	52 Piscium	6	12.5	14.1	16.8	29.3	31.0	32.8	34.5	36.1	48.6	51.4	53.0	26 32.74	0.13	24.17	0 26 8.70	0 01
	ζ Cassiopeæ	7	58.9	1.4	5.6	25.7	27.9	30.7	33.6	36.1	55.9	0.2	3.0	30 30.82	0.40	24.18	0 30 7.04	+ 0.60
	55 Piscium	8	30.8	32.5	35.2	48.0	49.6	51.3	53.0	54.6	7.5	10.2	11.8	33 51.32	0.14	24.18	0 33 27.28	− 0.02
	B. A. C. 224	9	36.4	37.9	40.8	54.2	56.1	57.9	59.7	1.6	15.0	18.1	19.8	42 57.95	0.18	24.18	0 42 33.95	0.00
	21 Ceti	10	10.4	11.8	14.6	26.5	28.0	29.7	31.3	32.8	45.0	47.7	40.2	48 29.73	0.00	24.18	0 48 5.55	0.40
	25 Ceti	11	54.6	56.0	58.6	10.6	12.1	13.8	15.4	17.0	28.9	31.5	33.1	57 13.78	0.02	24.18	0 56 49.62	− 0.42
	Polaris	12	57.0	2.0	52.0	. .	. .	. .	. .	. .	19.0	18.0	17.0	13 37.50	12.65	24.18	. . . .	+ 16.19
	44 Ceti	13	56.7	58.2	0.9	12.7	14.4	16.1	17.8	19.3	31.1	33.7	35.4	18 16.03	0.00	24.18	1 17 51.85	− 0 57
	109 Piscium	14	17.0	18.8	21.2	33.8	35.7	37.3	39.2	40.8	53.2	56.0	57.7	38 37.34	0.13	24.19	1 38 13.28	0.47
	β Arietis	15	55.2	56.7	59.4	12.1	13.6	15.5	17.1	18.7	31.5	34.2	36.0	48 15.45	0.13	24.19	1 47 51.39	0.54
	σ Piscium	16	46.8	48.4	50.5	2.7	4.2	5.8	7.5	8.9	20.7	23.5	25.0	56 5.82	0.05	24.19	1 55 41.68	0.70
	α Arietis	17	18.5	20.2	22.6	35.6	37.3	39.1	40.9	42.5	55.7	58.4	0.1	0 39.17	0.15	24.19	2 0 15.13	− 0.61
	Neptune	18	51.9	53.1	55.8	7.9	9 1	. .	12.6	14.1	26.4	29.1	30.7	4 11.10	0.09	24.19	2 3 46.00	. .
9	ζ Cassiopeæ	19	56.6	59.0	2.9	23.3	25.4	28.2	31.0	33.8	54.3	57.7	0.2	30 28.40	+ 0.35	21.56	0 30 7.19	+ 0.70
	β Ceti	20	26.6	28.2	30.8	43.6	45.2	46.9	48.6	50.1	2.7	5.6	7.2	37 46.86	− 0.03	21.56	0 37 25.27	− 0.38
	ν Cassiopeæ	21	43.2	45.7	49.5	8.3	10.5	13.4	16.0	18.3	36.9	41.0	43.3	42 13.28	+ 0.31	21.56	0 41 52.03	+ 0.48
	B. A. C. 274	22	29.9	31.2	33.8	45.7	47.0	48.8	50.6	52.2	4.1	6.6	8.4	53 48.94	0.06	21.56	0 53 27.44	− 0.26
	Polaris	23	53.0	59.0	50.0	. .	. .	. .	. .	. .	16.0	5.0	14.0	13 32.83	11.13	21.56	. . . .	+ 19.57
	Weisse 89	24	54 8	56.3	58.8	10.0	11.6	13.2	14.9	16.5	28.5	30.9	32.2	8 13.43	0.04	21.56	1 7 51.91	− 0.39
	Weisse 144	25	14.4	15.9	18.5	30.6	32.2	34.0	35.6	37.0	49.4	51.9	53.7	11 33 93	+ 0.09	21.56	1 11 12.46	0.30
	*+5° 58′	26	. .	. .	. .	36.1	37.8	39.7	41.1	43.0	54.8	57.2	58.7	14 46.05	− 6.45	21.56	1 14 18.04	0.40
	B. A. C. 424	27	28.1	29.9	32.7	47.0	48.9	50.8	52.8	54.5	8.5	11.7	13.5	18 50.76	− 0.09	21.56	1 18 29.11	0.75
	103 Piscium	28	39.7	41.3	44.1	56.4	57.9	59.6	1.4	2.8	15.4	18.0	19.6	32 59.65	+ 0.10	21.56	1 32 38.19	0.42
	107 Piscium	29	51.0	52.4	55.2	7.9	9.6	11.2	13.0	14.7	27.2	29.9	31.6	36 11.25	0.12	21.56	1 35 49.81	0.41
	υ Piscium	30	56.6	57.9	0.7	12.8	14.2	16.0	17.6	19.2	31.0	33.6	35.2	39 15.89	0.07	21.56	1 38 54.40	0.52
	β Arietis	31	52.5	54.0	56.6	9.3	10.9	12.8	14.5	16.2	28.9	31.6	33.2	48 12.77	0.12	21.56	1 47 51.33	0.49
	α Piscium	32	44.0	45.6	48.2	0.0	1.6	3.2	5.0	6.4	17.9	20.7	22.4	56 3.18	0.05	21.56	1 55 41.67	0.66
	Weisse 1040	33	45.4	46.9	49.3	1.6	3.1	. .	6.4	7 9	19.8	22.4	24.1	0 4.69	0.07	21.56	1 59 43.20	0.65
	Neptune	34	46.2	47.9	50.1	2.4	3.9	5.6	7.3	8.7	21.0	23.5	25.2	4 5.62	0.08	21.56	2 3 44.14	. .
	ξ¹ Ceti	35	31.9	33.4	35.8	47.8	49.4	51.3	52.8	54.3	6.3	9.0	10.6	6 51.15	0.07	21 56	. . . .	0.69
24	γ Ceti	36	55.2	56.8	59.5	11.4	12.9	14.5	16.1	17.8	29.6	32.3	33.8	37 14.54	0.05	18.18	2 36 56.41	0.72
	β Fornacis	37	53.0	54.8	57.7	12.0	13.9	15.9	17.7	19.7	33.8	36.9	38.8	44 15.84	+ 0.12	18.18	2 43 57.54	0.98
	ρ² Arietis	38	52.9	54.3	57.1	9.4	11.0	12.8	14.5	16.2	28.6	31.2	33.0	49 12.82	− 0.13	18.18	2 48 54.27	0 74
	α Ceti	39	50.9	52.4	54.8	6.8	8.4	10.0	11.6	13.0	25.3	27.8	29.2	56 10 02	+ 0.06	18.18	2 55 51.90	0.83
	*+9° 30′	40	21.2	22.5	24.9	. .	. .	. .	. .	. .	55.7	58.1	59.6	4 40.33	+ 0.08	18.19	3 4 22.22	0 86
	B. A. C. 1010	41	32.8	34.4	36.6	48.9	50.3	52.0	53.7	55.3	7.4	9.7	11.6	9 52.06	00	18.19	3 9 33.87	0.96
	15 Eridani	42	54.2	55.9	58.7	11.5	13.4	15.0	16.9	18.6	31.5	34.5	36.1	13 15.12	− 0.07	18.19	3 12 56.86	1.05
	Lacaille 1114	43	23.7	25.3	27.9	40.9	42.6	44.4	46.2	47.8	0.6	3.5	5.2	24 44.37	− 0.07	18.19	3 24 26.11	1.11
	B. A. C. 1105	44	34.9	36.9	40.2	56.6	58.4	0.7	2.9	4.9	20.8	24.6	26.7	30 0.69	+ 0.29	18.19	3 29 42.79	1.06
	ο Persei	45	31.0	32.9	36.0	50.1	51.8	54.1	56.1	57.8	12.2	15.2	17.0	34 54.02	0.23	18.19	3 34 36.06	1.07

Jan. 3. Image east 0^{r}.63; clamp west.
Image east 0^{r}.80; clamp east.

CORRECTIONS, &c.

Date.		Error of Clock.	Hourly rate.	n	c
1877.	h.	s.	s.	s.	s.
Jan. 5,	1.0	− 24.18	− 0.100	+ 0.25	+ 0.04
9.	1.5	− 21.56	− 0.001	+ 0.21	+ 0.04
24,	3.8	− 18.19	− 0.006	+ 0.26	+ 0.04

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductio to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	s.	s	h. m. s.	s.
Jan. 24	*+23° 15′ . . .	1	15.7	17.2	20.2	33.1	34.6	36.4	38.1	40.0	. .	. .	. .	39 29.41	+ 7.20	−18.19	3 39 18.42	− 1.0
Y.	*+23° 17′ . . .	2	58.6	0.2	2.9	15.8	17.5	19.2	21.0	22.7	. .	. .	. .	40 12.24	7.20	18.19	3 40 1.25	1.0
	*+23° 24′ . . .	3	. .	. .	. .	24.6	26.5	28.2	30.0	32.7	. .	. .	. .	40 28.40	+ 0.16	18.19	3 40 10.37	1.0
	*+23° 21′ . . .	4	. .	39.4	42.1	43.8	. .	. .	55.8	58.6	0.2	1.8	4.0	40 53.21	− 30.19	18.19	3 40 4.83	1.0
	*+75° 51′ . . .	5	. .	. .	. .	35.9	41.9	49.7	56.1	1.6	. .	. .	. .	45 49.04	+ 1.24	18.19	3 45 32.09	2.3
	*+75° 51′ . . .	6	12.5	18.3	28.7	. .	. .	. .	. .	. .	32.0	42.1	49.0	48 30.43	1.17	18.19	3 48 13.41	2.4
	*+75° 51′ . . .	7	. .	. .	. .	50.7	56.2	3.2	9.4	16.2	. .	. .	. .	49 3.14	1.24	18.19	3 48 46.19	2.4
	Lalande 7391 . .	8	11.6	13.5	15.6	31.7	34.0	35.9	38.0	40.2	55.4	58.5	0.6	54 35.91	0.26	18.19	3 54 17.98	1.2
	A^2 Tauri	9	42.1	44.1	46.1	47.6	50.4	. .	54.9	57.7	59.4	1.3	3.2	58 22.68	0.07	18.19	3 58 4 56	1.2
	*+21° 43′ . . .	10	3.1	4.8	7.6	20.3	22.1	23.8	25.5	27.0	39.8	42.6	44.2	58 23.71	0.15	18.19	3 58 5.67	1.2
	ω^1 Tauri	11	59.0	0.8	3.1	15.9	17.6	19.5	21.3	22.8	35.3	37.9	39.8	2 19.36	0.14	18.19	4 2 1.31	1.2
	γ Tauri	12	47.3	48.8	51.3	3.7	5.3	7.0	8.7	10.4	22.8	25.3	27.0	13 7.05	0.11	18.19	4 12 48.97	1.2
	ε Tauri	13	25.2	26.9	29.5	42.3	43.8	45.5	47.4	49.0	1.6	4.3	5.9	21 45.58	0.13	18.19	4 21 27.52	1.3
	Weisse (2) 506. .	14	51.7	53.4	56.3	11.4	13.1	14.9	17.0	18.6	33.0	36.7	39.0	25 15.01	0.24	18.19	4 24 57.06	1.4
	Weisse 646 . .	15	17.2	18.7	21.0	33.3	34.8	36.4	38.0	39.7	51.5	54.1	55.6	31 36.39	0.07	18.19	4 31 18.27	1.3
	9 Camelopardi . .	16	23.5	26.8	32.6	2.6	6.5	10.5	14.9	18.1	47.7	54.1	57.8	42 10.46	0.69	18.19	4 41 52.96	2.7
	*+13° 22′ . . .	17	56.3	57.7	0.3	12.0	14.2	15.8	17.6	19.0	31.5	34.0	35.7	49 15.88	0.10	18.19	4 48 57.79	1.4
	11 Orionis. . . .	18	. .	. .	. .	48.7	50.4	52.1	53.9	55.4	. .	. .	. .	57 52.10	0.12	18.19	4 57 34.03	1.5
25	Rumker 870 . .	19	45.3	46.8	49.5	2.2	3.6	5.2	6.9	8.6	21.2	24.1	25.8	23 5.38	0.13	18.52	3 22 46.99	0.9
	7 Tauri	20	8.2	9.9	12.5	25.4	27.3	28.9	30.7	32.4	45.5	48.4	50.1	27 29.03	0.18	18.52	3 27 10.69	0.9
	B. A. C. 1111 . .	21	7.2	10.5	16.1	42.2	45.6	49.1	52.5	55.9	22.3	27.8	31.0	31 49.11	+ 0.59	18.52	3 31 31..18	1.2
	ο Persei	22	. .	12.4	15.3	17.5	. .	. .	30.6	33.6	35.6	37.7	40.0	35 27.84	− 33.21	18.53	3 34 36.10	1.0
	*+23° 17′ . . .	23	15.8	17.3	20.1	33.1	34.7	36.6	38.3	40.0	52.9	55.7	57.5	39 36.55	+ 0.15	18.53	3 39 18.17	1.0
	*+23° 24′ . . .	24	. .	. .	. .	16.1	17.8	19.7	21.6	23.2	. .	. .	. .	40 19.68	+ 0.16	18.53	3 40 1.31	1.0
	*+23° 21′ . . .	25	. .	45.4	48.3	49.9	1.8	4.5	6.2	7.9	10.3	. .	. .	40 59.29	− 30.19	18.53	3 40 10.57	1.0
	*+35° 37′ . . .	26	41.0	42.8	45.9	0.3	2.4	4.4	6.3	8.2	22.9	26.1	28.0	49 4.39	+ 0.24	18.54	3 48 46.30	1.1
	γ^1 Eridani. . . .	27	17.5	19.0	21.5	33.7	35.4	37.2	38.8	40.4	52.7	55.4	57.0	52 37.15	− 0.02	18.54	3 52 18.59	1.1
	*+37° 48′ . . .	28	18.3	20.1	23.4	38.4	40.5	42.6	44.7	46.6	1.5	4.7	7.0	59 42.53	+ 0.25	18.55	3 59 24.23	1.2
	50 Persei	29	19.9	21.9	25.0	40.3	42.3	44.4	46.6	48.4	3.6	6.7	8.7	0 44.35	0.25	18.55	4 0 26.05	1.3
	γ Tauri	30	47.7	49.2	51.7	4.1	5.7	7.5	9.2	10.8	23.0	25.7	27.4	13 7.45	+ 0.11	18.56	4 12 49.00	1.2
	*−25° 40′ . . .	31	12.0	13.6	16.3	29.5	31.1	33.0	34.8	36.4	49.8	52 6	54.4	18 33.05	− 0.08	18.56	4 18 14.41	1.3
	*+35° 39′ . . .	32	24.6	26.1	29.8	43.5	45.1	46.5	48.3	50.3	6.2	8.5	10.2	24 46.28	+ 0.24	18.57	4 24 27.95	1.4
	Weisse (2) 506. .	33	. .	33.7	36.9	39.0	. .	. .	52.1	55.5	57.3	59.2	1.8	25 49.44	− 34.01	18.57	4 24 56.86	1.4
	*+22° 4′ . . .	34	44.3	46.0	48.4	1.4	3.1	4.9	6.6	8.2	21.0	23.5	25.5	30 4.81	+ 0 15	18.57	4 29 46.39	1.4
	B. A. C. 1448 . .	35	43.9	54.4	9.7	25.8	35.8	46.4	56.5	6.5	22.1	38.6	48.0	37 46.24	1.89	18.58	4 37 29.55	5.7
	*+43° 54′ . . .	36	. .	. .	. .	15.8	17.7	19.9	22.4	24.3	. .	. .	. .	45 20.02	0.32	18.59	4 45 1.75	1.7
	Lalande 9106 . .	37	55.2	57.4	0.8	17.5	19.5	21.5	23.7	26.1	42.9	46.2	48.5	46 21.75	+ 0.31	18.59	4 46 3.47	1.7
	*−25° 49′ . . .	38	. .	. .	. .	39.0	40.8	42.7	44.5	46.1	. .	. .	. .	51 42.62	− 0.07	18.59	4 51 23.96	1.4
	*+45° 6′ . . .	39	26.5	28.6	32.0	49.0	51.1	53.5	55.8	58.1	14.9	18.6	20.9	58 53.55	+ 0.32	18.60	4 58 35.27	1.9
	*−25° 33′ . . .	40	. .	. .	. .	. .	. .	. .	3.6	5.9	8.2	10.0	12.2	7 7.98	− 37.98	18.61	5 6 11.39	1.5
	β Tauri	41	29.5	31.3	34.0	47.5	49.3	51.3	53.1	54.9	8.4	11.2	13.1	18 51.24	+ 0.19	18.62	5 18 32.81	1.7
	χ Aurigæ. . . .	42	41.3	42.9	45.9	59.7	1.6	3.6	5.7	7.4	21.2	24.3	26.1	25 3.61	0.21	18.62	5 24 45.20	1.8
	B. A. C. 1751 . .	43	42.1	45.8	51.6	20.7	24.4	28 6	32.6	36.0	4.9	11.1	15.3	30 28.46	0.67	18.63	5 30 10.50	3.4
	*+38° 21′ . . .	44	0.9	2.8	6.0	21.3	23.0	25.1	27.3	29.1	44.4	47.6	49.6	35 25.19	0.26	18.63	5 35 6.82	2.0
	*+38° 7′ . . .	45	3.7	5.5	8.8	24.1	25.9	27.8	30.0	31.8	47.3	50.5	52.3	39 27.97	+ 0.25	18.63	5 39 9.59	2.0
	Weisse 1143¹ . .	46	58.3	59.8	2.4	14.7	16.3	17.8	19.4	21.2	33.5	36.0	37.7	46 17.92	− 0.02	18.64	5 45 59.26	1.6
	*+7° 29′ . . .	47	11.1	12.4	14.8	27.0	28.5	30.1	32.0	33.6	44.6	47.7	49.5	51 30.12	+ 0.07	18.64	5 51 11.55	− 1.7
	δ Ursæ Minoris, S. P.	48	. .	. .	. .	8.0	33.0	1.0	29.0	53.0	. .	. .	. .	12 0.80	3.59	18.66	6 12 8.00	+ 23.4
	47 Aurigæ. . . .	49	44.9	46.9	50.6	8.0	10.4	12.8	15.1	17.3	34.7	38.4	40.8	21 12.72	0.34	18.67	6 20 54.39	− 2.6
	*+28° 7′ . . .	50	55.8	57.5	0.3	14.1	15.7	17.2	19.1	21.0	34.5	37.4	39.3	26 17.45	+ 0.18	−18.68	6 25 58.95	− 2.1

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s,	s.
Jan. 25, 5.0	− 18.60	− 0.051	+ 0.26	+ 0.04

server.	OBJECT.	Number.	I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
77.														m. s.	m. s.	s.	h. m. s.	s.
. 25	49 Aurigæ	1	26.0	27.9	30.7	44.1	46.0	47.9	49.6	51.3	4.8	7.9	9.6	27 47.80	+ 0.18	−18.68	6 27 29.30	− 2.11
Y.	γ Geminorum	2	37.0	38.6	41.1	53.4	55.2	56.8	58.6	0.2	12.5	15.2	17.0	30 56.87	0.12	18.68	6 30 38.31	1.93
	51 Cephei	3	. .	. .	. .	52.5	24.0	0.5	38.0	7.0	. .	. .	. .	43 0.40	6.41	18.69	. . . .	− 33.25
26	Polaris	4	40.0	49.0	36.0	. .	. .	. .	. .	. .	10.0	55.0	57.0	12 21.33	+ 6.39	20.16	. . . .	+ 34.68
	o Piscium	5	56.0	57.6	0.2	12.2	13.7	15.5	17.1	18.8	30.8	33.4	34.8	39 15.46	− 0.89	20.09	1 38 54.48	− 0.33
	β Arietis	6	50.8	52.7	55.3	8.1	9.6	11.3	13.2	15.0	27.6	30.2	31.8	48 11.42	0.34	20.06	1 47 51.02	0.28
	*+14° 41'	7	21.3	22.6	24.5	40.0	41.2	42.7	44.0	45.3	0.3	2.3	4.0	52 42.56	0.60	19.89	2 52 22.07	0.75
	*+24° 12'	8	43.3	45.5	47.1	49.1	51.8	. .	58.2	1.0	2.8	4.5	6.6	40 24.99	0.07	19.78	3 40 5.14	1.06
	*+24° 16'	9	6.1	7.8	10.5	23.8	25.3	27.2	29.0	30.7	43.9	46.5	48.2	40 27.18	0.14	19.78	3 40 7.26	1.06
	Weisse (2) 931	10	19.0	20.8	23.6	37.0	38.6	40.4	42.2	44.0	57.5	0.1	1.9	43 40.46	0.02	19.76	3 43 20.68	1.09
	γ¹ Eridani	11	20.6	22.3	25.0	37.2	38.7	40.4	42.1	43.6	56.0	58.6	0.2	52 40.43	2.04	19.73	3 52 18.66	1.17
	A¹ Tauri	12	25.3	27.1	29.9	42.6	44.2	46.0	47.8	49.5	2.4	5.1	6.6	57 46.05	0.27	19.72	3 57 26.06	1.18
	A² Tauri	13	. .	. .	. .	21.4	23.0	24.8	26.6	28.3	41.1	43.7	45.4	58 31.79	7.24	19.72	3 58 4.83	1.18
	ι Tauri	14	1.0	3.0	5.5	18.0	19.5	21.3	23.0	24.6	37.5	40.0	41.6	2 21.36	0.38	19.72	4 2 1.26	1.20
	Weisse (2) 344	15	25.7	27.4	30.0	42.5	43.9	45.7	47.4	49.0	1.5	4.1	5.7	17 45.72	− 0.51	19.67	4 17 25.54	1.29
	Weisse (2) 506	16	52.8	54.4	57.6	12.3	14.1	16.2	18.2	20.2	35.0	37.9	39.6	25 16.21	+ 0.38	19.66	4 24 56.93	1.46
	*+22° 4'	17	46.6	48.4	50.9	4.0	5.5	7.2	8.8	10.6	. .	. .	. .	29 0.25	+ 6.73	19.64	4 28 47.34	1.39
	*+33° 31'	18	. .	. .	. .	22.5	24.4	26.3	28.3	30.2	44.5	47.5	49.3	33 34.12	− 7.44	19.64	4 33 7.04	1.51
	*−26° 00'	19	. .	. .	. .	55.2	56.7	58.6	0.3	2.0	15.5	18.0	19.8	36 5.76	− 10.03	19.63	4 35 36.10	1.41
	*+10° 43'	20	29.9	31.6	34.0	46.3	47.8	49.6	51.2	52.8	. .	. .	. .	40 42.90	+ 5.81	19.61	4 40 29.10	1.40
	*+10° 42'	21	. .	. .	. .	0.3	1.8	3.4	5.3	6.7	. .	. .	. .	41 3.50	− 0.79	19.61	4 40 43.10	1.40
	*+10° 43'	22	. .	. .	. .	. .	. .	. .	36.8	39.5	41.0	42.8	44.5	41 40.92	35.44	19.61	4 40 45.87	1.41
	*+10° 43'	23	. .	. .	. .	24.2	26.4	28.1	. .	. .	. .	. .	. .	41 26.23	− 18.35	19.61	4 40 48.27	1.41
	*+43° 54'	24	56.9	59.6	2.9	19.4	21.4	23.6	26.0	27.9	44.7	48.0	50.0	46 23.67	+ 0.93	19.59	4 46 5.01	1.78
	*−25° 49'	25	. .	3.7	6.3	7.8	. .	. .	19.9	23.0	24.8	26.5	29.0	52 17.62	− 33.65	19.58	4 51 24.39	1.48
	*+23° 32'	26	56.7	58.6	1.4	14.8	16.5	18.4	20.2	21.9	35.4	38.1	39.7	57 18.34	0.18	19.57	4 56 58.59	1.58
	*+30° 13'	27	. .	36.5	39.0	40.8	. .	. .	54.6	57.5	59.2	1.1	3.3	4 51.50	− 31.97	19.56	5 3 59.97	1.70
	B. A. C. 1619	28	18.0	26.2	28.3	34.7	42.0	49.6	57.9	6.0	1.5	13.1	20.3	10 49.78	+ 7.04	19.53	5 10 36.29	5.52
	δ Orionis	29	46.5	48.2	50.8	2.5	4.1	5.8	7.5	9.0	20.9	23.4	24.9	26 5.78	− 1.32	19.50	5 25 44.96	1.57
	Weisse 603	30	27.9	29.8	31.6	33.2	35.7	. .	36.0	38.5	39.9	41.7	43.7	26 5.80	1.25	19.50	5 25 45.05	1.58
	ε Orionis	31	1.4	3.1	5.6	17.5	19.0	20.7	22.3	23.8	35.7	38.3	39.7	30 20.65	1.36	19.48	5 29 59.81	− 1.58
29	Polaris	32	. .	. .	. .	. .	. .	. .	. .	. .	21.0	5.0	10.0	25 52.00	12 29.27	17.81	. . . .	+ 37.47
	β Arietis	33	49.0	50.7	53.4	6.1	7.7	9.9	11.2	12.8	25.5	28.2	29.9	48 9.45	0.58	17.82	1 47 51.05	− 0.29
	*+31° 17'	34	39.6	41.7	44.5	58.7	0.1	2.0	3.9	5.9	19.9	22.8	24.6	28 2.15	0.54	17.86	3 27 43.75	0.93
	*+31° 16'	35	. .	36.1	38.9	40.7	53.6	56.7	58.5	0.3	2.4	. .	. .	28 50.90	33.01	17.86	3 28 0.03	0.94
	*+20° 10'	36	. .	. .	. .	20.7	22.2	23.9	25.7	27.4	. .	. .	. .	39 23.98	7.48	17.86	3 38 58.64	1.01
	Weisse (2) 931	37	17.4	19.3	22.4	35.3	36.7	38.5	40.0	41.9	56.3	58.8	0.4	43 38.82	0.55	17.86	3 43 20.41	1.05
	33 Tauri	38	44.9	46.5	49.3	2.3	4.0	5.7	7.5	9.1	22.1	24.8	26.4	50 5.69	0.57	17.86	3 49 47.26	1.09
	γ¹ Eridani	39	17.7	19.5	22.1	34.0	35.6	37.2	39.0	40.6	52.6	55.2	56.8	52 37.30	0.83	17.87	3 52 18.60	1.13
	*+21° 43'	40	3.2	5.0	7.6	20.6	22.1	24.0	25.7	27.6	40.2	42.9	44.5	58 23.95	0.58	17.87	3 58 5.50	1.14
	*−6° 49'	41	56.0	57.6	0.2	12.2	13.7	15.3	17.0	18.6	30.6	33.0	34.6	7 15.35	0.76	17.87	4 6 56.72	1.18
	O. Arg. S. 2939	42	33.6	35.2	37.9	51.1	52.7	54.2	56.0	57.9	10.7	12.5	15.1	10 54.26	0.95	17.87	4 10 35.44	1.25
	56 Persei	43	35.8	37.9	40.9	55.2	57.0	58.9	0.8	2.7	17.0	20.0	21.8	16 58.91	0.53	17.87	4 16 40.51	1.40
	α Tauri	44	51.8	53.5	55.9	8.4	10.0	11.7	13.4	15.0	27.5	30.1	31.7	29 11.73	0.60	17.88	4 28 53.25	1.33
	B. A. C. 1448	45	47.0	57.5	13.0	29.2	38.9	49.8	0.3	10.2	26.6	42.1	51.2	37 49.62	1.70	17.88	4 37 30.04	5.22
	B. A. C. 1518	46	44.6	46.7	49.5	2.5	4.2	6.0	7.7	9.5	22.6	25.2	26.9	49 5.96	0.56	17.89	4 48 47.51	1.50
	64 Eridani	47	13.1	14.8	17.4	29.8	31.3	32.9	34.5	36.2	48.3	50.8	52.4	54 32.86	0.82	17.89	4 54 14.15	1.40
	11 Orionis	48	32.7	34.4	37.0	49.3	50.7	52.5	54.3	55.8	8.3	10.8	12.4	57 52.56	0.60	17.89	4 57 34.07	1.49
	μ Aurigæ	49	56.5	58.5	1.4	16.8	18.7	20.8	22.9	24.7	40.2	43.4	45.0	5 20.81	0.53	17.89	5 5 2.39	1.79
	β Tauri	50	29.2	31.0	33.9	47.4	49.0	51.0	52.8	54.6	8.3	11.1	12.7	18 51.00	− 0.55	−17.90	5 18 32.55	− 1.73

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Jan. 26, 3.6	− 19.78	+ 0.157	+ 2.84	− 1.30
29, 4.1	− 17.87	− 0.022	+ 0.46	− 0.70

490. Adjusted level.

January 26. Image east 0ˢ.16; clamp east.
Image east 0ˢ.10; clamp west.

For some reason not known the instrument became unadjusted, and remained so for several days.

January 27. Image east 0ˢ.44; clamp east.
Image west 0ˢ.13; clamp west.

19. Only star.

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.			Observed Right Ascension.		Reductio to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.		Inst.	Clock.			
1877.														m. s.		s.	s.	h. m. s.		s.
Feb. 8 Y.	α Ceti	1	54.8	56.4	59.0	10.9	12.4	14.1	15.8	17.4	29.3	31.8	33.3	56 14.11	—	1.82	—20.49	2 55 51.80	—	0.63
	B. A. C. 975	2	7.3	9.0	11.4	23.5	25.0	26.6	28.2	29.8	41.9	44.4	45.9	2 26.64		1.85	20.48	3 2 4.31		0.65
	ζ Arietis	3	52.5	54.2	56.9	9.7	11.2	12.9	14.7	16.4	29.2	31.7	33.4	8 12.98		2.01	20.46	3 7 54.51		0.65
	15 Eridani	4	58.0	59.7	2.4	15.5	17.0	18.7	20.5	22.3	35.4	38.1	39.7	13 18.85		1.85	20.45	3 12 56.55		0.51
	65 Arietis	5	23.1	25.0	27.6	40.3	42.1	43.6	45.4	47.0	59.8	2.4	4.0	17 43.66		2.01	20.44	3 17 21.21		0.72
	Lacaille 1102	6	36.9	38.7	41.6	55.3	57.0	58.7	0.7	2.5	16.2	19.0	20.7	21 58.85		1.92	20.44	3 21 36.49		0.87
	*+31° 17′	7	22.0	24.2	26.1	28.0	31.0	. .	41.3	44.5	46.1	48.2	50.5	28 6.19		2.17	20.43	3 27 43.59		0.77
	*+31° 15′	8	38.2	40.2	42.2	44.0	47.0	. .	57.5	0.5	2.2	4.2	6.5	28 52.25		2.17	20.43	3 28 29.65		0.78
	Weisse (2) 750	9	30.4	32.9	34.9	37.2	40.3	. .	56.5	0.0	2.0	4.0	6.5	36 18.47		2.38	20.42	3 35 55.67		0.83
	Weisse (2) 751	10	56.6	58.7	2.0	17.1	19.0	21.0	23.0	25.1	40.3	43.2	45.2	36 21.02		2.47	20.42	3 35 58.13		0.84
	*+23° 14′	11	19.5	21.3	23.8	37.0	38.6	40.4	42.1	44.0	56.8	59.6	1.2	39 40.39		2.06	20.42	3 39 17.91		0.87
	*+23° 14′	12	21.8	23.6	26.3	39.3	41.0	42.7	44.4	46.2	59.2	1.8	3.5	40 42.71		2.06	20.41	3 40 20.24		0.87
	Weisse (2) 931	13	39.4	40.8	42.8	44.7	46.5	. .	17.2	19.7	21.2	22.9	25.4	44 2.06		21.20	20.41	3 43 20.45		0.90
	Rumker 1023	14	30.3	31.9	34.6	47.1	48.7	50.4	52.2	53.8	6.2	8.8	10.5	47 50.41		1.95	20.40	3 47 28.06		0.93
	γ¹ Eridani	15	20.8	22.5	25.1	37.3	38.8	40.5	42.3	43.9	56.3	58.7	0.2	52 40.58		1.80	20.39	3 52 18.39		0.98
	A² Tauri	16	6.0	7.7	10.7	23.5	25.1	26.8	28.7	30.4	43.2	45.8	47.5	58 26.85		2.03	20.39	3 58 4.43		1.01
	*+21° 43′	17	46.9	49.1	50.9	52.7	55.4	. .	0.0	2.9	4.5	6.2	8.1	58 27.67		1.95	20.39	3 58 5.33		1.01
	*−31° 22′	18	. .	25.9	28.6	30.4	. .	. .	43.2	46.2	48.0	50.1	52.2	1 40.57		34.47	20.38	4 0 45.72		1.07
	51 Tauri	19	9.2	11.0	13.7	26.5	28.1	29.8	31.7	33.2	46.2	48.8	50.3	11 29.86		2.03	20.37	4 11 7.46		1.10
	63 Tauri	20	25.0	26.8	29.3	41.9	43.4	45.1	46.9	48.5	1.0	3.6	5.0	16 45.14		1.95	20.36	4 16 22.83		1.12
	Weisse (2) 506	21	. .	57.4	0.5	15.3	17.1	18.9	20.9	23.1	37.8	40.8	. .	25 19.09		2.37	20.35	4 24 56.37		1.28
	B. A. C. 1448	22	59.8	9.0	25.6	42.5	51.3	1.5	12.4	22.4	38.6	54.1	4.5	38 1.97		13.00	20.34	4 37 28.63		4.35
	*+10° 43′	23	45.5	47.3	49.7	. .	. .	. .	. .	. .	20.5	23.1	21.6	42 6.51		1.87	20.33	4 41 44.31		1.26
	*+10° 43′	24	. .	. .	. .	. .	. .	. .	40.7	43.4	45.0	46.7	48.8	42 44.92		36.54	20.33	4 41 48.05		1 26
	Lalande 9106	25	59.6	1.9	5.1	21.9	24.0	26.3	28.4	30.7	47.2	50.5	52.6	46 26.20		2.73	20.32	4 46 3.15		1.57
	B. A. C. 1531	26	30.0	31.9	34.6	48.0	49.7	51.5	53.2	55.0	8.2	10.9	12.5	50 51.41	—	1.89	20.32	4 50 29.20		1.27
	*+27° 35′	27	58.8	0.5	3.4	16.9	18.6	20.4	22.3	23.9	. .	. .	. .	57 13.10	+	5.14	20.31	4 56 57.93		1.46
	*+27° 34′	28	39.6	41.5	43.5	45.1	47.0	0.2	2.9	4.6	. .	. .	. .	57 50.55	—	9.47	20.31	4 57 20.77		1.46
	*+27° 33′	29	. .	15.5	18.2	20.1	. .	. .	32.5	35.5	37.0	38.8	41.0	58 29.82		33.47	20.31	4 57 36.04		1.46
	B. A. C. 1619	30	34.5	42.1	54.4	50.6	57.5	5.9	14.0	20.2	17.3	29.5	36.3	11 5.66		9.67	20.29	5 10 35.70		4.66
	β Tauri	31	33.2	35.3	38.0	51.6	53.3	55.1	7.0	8.8	12.5	15.2	16.8	18 55.16		2.18	20.28	5 18 32.70		1.62
	*+20° 27′	32	. .	. .	. .	59.9	1.5	3.2	4.8	6.6	. .	. .	. .	22 3.20		2.01	20.27	5 21 40.92		1.56
	δ Orionis	33	47.9	49.5	52.0	3.9	4.4	7.0	8.7	10.4	22.2	24.5	26.1	26 6.96	—	1.80	20.27	5 25 44.89	—	1.45
	δ Ursæ Minoris, S. P.	34	2.0	30.0	9.5	30.0	57.0	26.0	54.0	21.5	41.0	23.5	52.0	11 25.87	+	34.42	20.21	. . . .	+	20.66
	51 Cephei	35	. .	. .	. .	41.0	14.0	48.0	22.0	57.0	. .	. .	. .	43 48.40	—	42.52	20.17	. . . .	—	30.83
10	Weisse (2) 344	36	21.9	23.5	26.1	38.6	40.2	41.9	43.8	45.1	57.6	0.3	2.0	17 41.91		0.78	15.53	4 17 25.60		1.10
	ε Tauri	37	23.6	25.2	27.7	40.4	42.0	43.8	45.4	47.2	59.8	2.4	4.1	21 43.78		0.92	15.52	4 21 27.34		1.14
	Weisse (2) 506	38	51.0	52.8	56.0	. .	12.6	14.5	16.3	. .	33.2	36.5	38.4	25 14.59		2.15	15.52	4 24 56.92		1.24
	α Tauri	39	49.4	50.9	53.5	5.9	7.6	9.3	11.0	12.5	25.0	27.7	29.4	29 9.29		0.76	15.52	4 28 53.01		1.18
	*+33° 31′	40	1.6	3.4	6.4	20.6	22.4	24.4	26.5	28.4	42.7	45.6	47.8	33 24.53		1.97	15.52	4 33 7.04		1.29
	*+10° 45′	41	34.8	36.4	39.0	. .	. .	. .	. .	. .	9.7	12.1	13.8	41 54.30		0.43	15.52	4 41 38.35		1.2
	*+43° 58′	42	. .	. .	. .	15.8	17.9	20.2	22.5	24.4	. .	. .	. .	45 20.16		2.93	15.52	4 45 1.71		1.5
	Lalande 9106	43	. .	. .	. .	17.5	19.7	22.0	24.3	26.4	. .	. .	. .	46 21.98	—	2.93	15.52	4 46 3.53		1.5
	*−25° 49′	44	15.7	17.1	19.7	33.0	34.6	36.6	38.8	40.4	53.4	56.1	57.8	51 36.65	+	1.85	15.52	4 51 22.98		1.2
	*+30° 19′	45	41.2	43.0	45.7	59.5	1.4	3.5	5.5	7.1	20.7	23.8	25.8	5 3.38	—	1.71	15.51	5 4 46.16		1.5
	Weisse (2) 111	46	19.5	21.0	23.9	37.9	39.7	41.5	43.3	45.1	59.0	1.9	2.8	6 41.42		1.71	15.51	5 6 24.20		1.5
	*+30° 15′	47	27.0	28.6	31.2	. .	. .	. .	. .	. .	6.5	9.2	11.2	7 48.95	—	1.72	15.51	5 7 31.72		1.5
	*−25° 23′	48	34.9	36.5	39.2	52.5	54.0	55.9	57.6	59.5	12.6	15.3	17.2	14 55.93	+	1.82	15.51	5 14 42.24		1.3
	*+38° 43′	49	. .	40.9	43.2	1.0	2.5	4.3	6.6	8.2	23.8	26.4	. .	21 4.10	—	2.43	15.51	5 20 46.16		1.7
	ε Orionis	50	55.8	57.3	59.7	11.8	13.3	15.0	16.4	17.8	30.0	32.4	33.9	30 14.86	+	0.29	—15.50	5 29 59.65	—	1.4

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Feb. 8, 3.8	— 20.40	+ 0.080	— 0.24	— 1.80
10, 5.2	— 15.51	+ 0.018	— 3.35	+ 0.21

Feb. 9. Image east $0^{r}.04$, clamp east.
Image east 1 .57, clamp west.
10. Image east 0 .84, clamp west.
Image east 0 .15, clamp east.

server.	OBJECT.	Number.	I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
17.														m. s.	s.	s.	h. m. s.	s.
10	*+38° 11′	1	32.1	34.2	37.0	..	..	..	..	..	15.7	18.6	20.9	35 56.42	− 2.38	−15.50	5 35 38.54	− 1.86
	*+38° 12′	2	43.8	45.5	48.5	..	..	..	..	..	..	..	..	35 45.83	+ 19.59	15.50	5 35 51.92	1.86
	*+38° 7′	3	45.9	47.4	50.8	5.9	7.7	10.0	12.0	13.9	29.1	32.4	34.3	38 9.95	− 2.37	15.50	5 37 52.08	1.88
	*+38° 5′	4	52.4	54.3	56.8	..	..	..	..	..	15.7	18.9	20.9	39 6.65	− 2.38	15.50	5 38 48.77	1.90
	*+38° 5′	5	..	46.5	49.9	51.8	..	..	6.0	9.2	11.2	13.3	15.6	40 2.94	+ 37.76	15.50	5 39 9.68	1.90
	*−29° 56′	6	..	..	..	36.3	38.0	39.9	42.1	43.9	..	..	..	50 40.04	+ 2.18	15.50	5 50 26.72	1.49
	*+20° 12′	7	17.4	18.8	21.1	34.1	35.7	37.5	39.1	40.9	53.6	56.2	58.0	0 37.49	− 1.01	15.50	6 0 20.98	− 1.76
	δ Ursæ Minoris, S.P.	8	..	..	..	10.0	36.0	3.5	31.0	58.0	..	..	..	11 3.70	+ 52.73	15.49	. . . .	+ 20.21
	B. A. C. 2069	9	26.6	33.7	44.7	43.6	51.3	58.7	6.9	14.1	12.1	24.4	32.5	21 58.96	− 14.86	15.49	6 21 28.61	− 7.01
	γ Geminorum	10	34.7	36.3	38.7	51.4	52.9	54.7	56.3	57.8	10.2	12.9	14.6	30 54.59	0.77	15.49	6 30 38.33	1.86
	42 Camelopardi	11	44.4	48.3	55.1	26.5	30.5	35.0	39.2	42.9	14.6	21.4	25.8	38 34.88	7.62	15.48	6 38 11.78	4.37
	51 Cephei	12	..	..	..	0.0	34.0	5.5	40.0	13.0	..	..	..	44 6.50	64.88	15.48	. . . .	30.44
13	ε Tauri	13	20.1	21.9	24.5	36.9	38.7	40.5	42.2	43.9	56.6	59.1	0.7	21 40.46	0.02	13.23	4 21 27.21	1.10
	α Tauri	14	46.2	48.0	50.6	2.9	4.5	6.0	7.8	9.6	22.0	24.6	26.1	29 6.21	0.01	13.23	4 28 52.97	1.14
	B. A. C. 1448	15	39.2	49.4	5.2	21.5	30.9	41.4	51.7	2.4	17.9	33.8	43.0	37 41.49	− 1.44	13.22	4 37 26.83	3.74
	Weisse 972	16	45.6	47.5	49.9	1.9	2.5	5.0	6.6	8.3	20.3	22.6	24.3	46 4.95	+ 0.07	13.22	4 45 51.80	1.19
	*−25° 49′	17	15.6	17.0	19.9	..	..	..	..	..	51.6	53.9	55.5	51 35.57	+ 0.25	13.22	4 51 22.60	1.19
	*+45° 6′	18	21.4	23.7	27.1	44.4	46.3	48.7	51.1	53.3	10.0	13.3	15.5	58 48.62	− 0.20	13.22	4 58 35.20	1.62
	*+30° 17′	19	1.4	2.9	5.7	17.8	19.3	21.0	22.7	24.4	36.5	38.9	40.4	5 21.00	0.09	13.21	5 5 7.70	1.48
	*+30° 15′	20	58.7	0.2	2.0	3.6	5.2	17.3	19.9	21.4	..	..	..	6 8.54	0.09	13.21	5 5 55.24	1.48
	B. A. C. 1619	21	17.6	25.0	37.6	33.9	40.9	48.6	56.9	4.3	0.6	12.6	19.7	10 48.88	1.06	13.21	5 10 34.61	4.25
	*+20° 23′	22	33.7	35.5	38.1	50.9	52.6	54.2	56.1	57.8	10.5	13.0	14.6	21 54.27	0.03	13.21	5 21 41.03	1.50
	B. A. C. 1751	23	36.7	40.8	47.0	15.7	19.4	23.3	27.2	31.3	0.5	6.3	9.4	30 23.42	0.49	13.20	5 30 9.73	2.88
	*+38° 11′	24	27.2	29.2	32.5	..	..	..	..	..	10.9	14.2	16.0	35 51.67	0.13	13.20	5 35 38.34	1.83
	*+38° 11′	25	38.6	40.7	43.9	..	..	..	..	..	22.3	25.2	27.3	36 3.00	0.13	13.20	5 35 49.67	1.83
	*+38° 7′	26	..	..	..	..	49.0	51.0	53.0	..	10.5	13.6	15.4	37 2.08	11.11	13.20	5 36 37.77	1.84
	*+38° 7′	27	40.8	42.9	46.4	1.0	3.0	5.1	7.3	9.2	24.5	27.6	29.6	38 5.22	0.14	13.20	5 37 51.88	1.85
	*+38° 7′	28	..	..	..	56.4	58.1	0.0	1.6	3.3	..	..	..	38 59.88	0.15	13.20	5 38 46.53	1.86
	*+38° 7′	29	..	..	..	18.6	20.8	22.5	24.7	26.6	..	..	..	39 22.64	0.15	13.20	5 39 9.29	1.86
	*+ 7° 18′	30	59.5	1.2	3.6	15.6	17.3	18.9	20.4	22.0	34.1	36.4	38.0	50 18.82	+ 0.04	13.20	5 50 5.66	1.55
	*+ 7° 22′	31	9.2	10.8	13.5	25.4	26.8	28.5	30.3	31.9	43.8	46.1	48.0	51 28.57	+ 0.04	13.20	5 51 15.41	1.56
	Weisse 1479	32	..	..	..	..	..	..	..	..	6.4	9.0	10.5	59 8.63	− 17.64	13.19	5 58 37.80	1.48
	Weisse 1487	33	..	..	..	..	..	..	..	..	28.6	31.2	32.8	59 30.87	17.64	13.19	5 59 0.04	1.48
	Weisse 1500	34	..	47.2	49.9	51.3	..	..	2.6	5.2	6.9	8.4	10.5	0 0.25	− 28.46	13.19	5 59 18.60	− 1.48
	δ Ursæ Minoris, S.P.	35	..	..	..	56.0	23.0	51.0	18.0	42.5	..	..	..	11 50.10	+ 4.04	13.19	. . . .	+ 19.42
	B. A. C. 2069	36	8.9	17.0	29.4	27.2	34.2	41.6	49.9	57.5	55.3	7.5	14.9	21 42.13	− 1.08	13.19	6 21 27.86	− 6.83
	γ Geminorum	37	31.5	33.0	35.8	48.2	49.8	51.6	53.2	54.8	7.4	9.7	11.6	30 51.51	− 0.01	13.18	6 30 38.32	1.84
	O. Arg. S. 5522	38	43.9	45.8	48.6	2.1	3.8	5.6	7.5	9.2	22.9	25.5	27.2	37 5.65	+ 0.25	13.18	6 36 52.72	1.62
	51 Cephei	39	..	..	..	57.0	29.0	2.0	37.0	8.5	..	..	..	43 2.70	− 4.98	13.18	. . . .	29.67
	*−30° 43′	40	..	..	..	2.1	4.0	6.2	8.0	9.0	23.4	25.9	27.9	53 13.39	7.26	13.18	6 52 52.95	1.65
	44 Geminorum	41	..	..	..	6.0	7.6	9.4	11.3	13.0	..	..	..	58 9.46	0.06	13.17	6 57 56.23	2.07
	*+22° 53′	42	..	55.0	57.8	59.4	..	..	11.1	14.0	15.7	17.6	19.5	59 8.76	30.18	13.17	6 58 25.41	2.07
	*−14° 42′	43	..	..	..	..	..	..	..	..	18.5	20.8	22.9	3 20.73	17.68	13.17	7 2 49.88	1.71
	*−14° 42′	44	..	..	..	..	..	..	..	..	25.6	28.1	30.1	3 27.93	17.68	13.17	7 2 57.08	1.71
	B. A. C. 2377	45	31.0	41.6	58.0	15.5	25.6	35.6	47.1	56.6	14.5	29.9	40.0	12 35.95	1.47	13.17	7 12 21.31	10.86
	O. Arg. S. 6754	46	13.4	15.0	17.6	30.4	31.9	33.7	35.4	37.0	49.7	52.5	53.9	19 33.68	+ 0.19	13.16	7 19 20.71	1.74
	O. Arg. S. 6762	47	..	56.5	59.3	0.6	..	..	11.8	14.6	16.5	18.2	20.2	20 9.71	− 29.12	13.16	7 19 27.43	1.74
	Weisse (2) 594	48	..	11.2	14.6	16.5	..	..	31.0	34.4	36.5	38.6	41.1	23 27.99	− 36.77	13.16	7 22 38.06	2.67
	Lacaille 7876	49	58.7	0.5	3.4	16.4	18.0	19.7	21.5	23.1	36.4	38.9	40.5	32 19.74	+ 0.24	13.16	7 32 6.82	1.76
	β Geminorum	50	41.2	43.0	45.7	59.4	1.0	2.8	4.8	6.7	19.6	22.8	24.5	38 2.86	− 0.08	−13.16	7 37 49.62	− 2.35

Feb. 13. Image west $0^r.45$; clamp east.
Image west $0^r.23$; clamp west.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Feb. 13, 6.2	− 13.19	+ 0.021	− 0.31	+ 0.08

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductio to 1877.0
1877.														m. s.	s.	s.	h. m. s.	s.
Feb. 13	*+38° 9′	1	41.5	43.6	46.7	2.3	4.1	6.0	7.9	10.2	25.5	28.6	30.6	43 6.09	− 0.14	−13.16	7 42 52.79	− 2.6
Y.	φ Geminorum	2	52.0	53.9	56.6	10.3	11.8	13.7	15.6	17.2	30.7	33.5	35.2	46 13.68	− 0.07	13.16	7 46 0.45	2.3
14	γ Tauri	3	37.4	38.9	41.7	54.1	55.5	57.3	58.8	0.5	13.0	15.6	17.2	12 57.27	+ 0.46	9.00	4 12 48.73	1.01
	*−25° 40′	4	2.5	4.3	7.0	20.3	21.8	23.7	25.7	27.1	40.5	43.3	45.0	18 23.75	− 0.58	8.99	4 18 14.18	1.0
	α Tauri	5	41.4	42.9	45.6	58.1	59.7	1.5	3.0	4.7	17.1	19.8	21.3	29 1.37	+ 0.49	8.98	4 28 52.88	1.1
	Weisse 725	6	22.3	24.0	26.5	38.5	39.9	41.7	43.3	45.1	56.9	59.5	1.0	34 41.70	0.28	8.97	4 34 33.01	1.1
	*+10° 42′	7	3.3	4.9	7.3	19.3	20.9	22.5	24.1	25.7	. .	. .	. .	41 16.00	6.90	8.97	4 41 13.93	1.1
	*+10° 45′	8	. .	. .	. .	34.6	36.0	37.7	39.3	40.9	. .	. .	. .	41 37.70	0.30	8.97	4 41 29.03	1.1
	*+10° 43′	9	. .	. .	. .	48.1	49.8	51.6	53.3	54.7	. .	. .	. .	41 51.50	+ 0.30	8.97	4 41 42.83	1.1
	*+10° 43′	10	. .	7.0	9.6	11.3	. .	. .	22.2	24.9	26.4	28.0	30.1	42 19.94	− 27.94	8.97	4 41 43.03	1.1
	*+10° 46′	11	. .	. .	. .	45.3	47.0	48.6	50.4	51.7	4.1	6.5	8.0	42 55.20	− 6.29	8.97	4 42 39.94	1.1
	*+43° 47	12	55.8	58.2	1.6	18.2	20.7	22.6	24.7	26.8	43.5	47.1	49.2	47 22.58	+ 1.44	8.96	4 47 15.06	1.4
	*−25° 49	13	. .	. .	. .	29.7	31.1	33.0	34.9	36.5	. .	. .	. .	51 33.04	− 0.59	8.95	4 51 23.50	1.1
	*+27° 34′	14	44.5	46.3	49.2	2.8	4.1	6.0	7.9	9.9	23.4	26.0	27.9	57 6.18	+ 0.82	8.95	4 56 58.05	1.3
	*−23° 48′	15	10.0	11.7	14.5	27.6	29.3	31.0	32.9	34.6	47.7	51.4	52.0	0 31.15	− 0.53	8.95	5 0 21.67	1.21
	*+30° 13′	16	. .	. .	. .	3.9	5.6	7.6	9.6	11.6	. .	. .	. .	4 7.66	+ 0.89	8.94	5 3 59.61	1.4
	*+30° 17′	17	31.4	33.2	35.9	. .	. .	. .	. .	. .	11.2	14.1	16.0	4 53.63	0.91	8.94	5 4 45.60	1.4
	Weisse (2) 111	18	10.0	11.8	14.7	28.4	30.1	32.1	34.1	35.8	49.5	52.5	54.1	6 32.10	+ 0.90	8.94	5 6 24.06	1.4
	B. A. C. 1619	19	4.4	12.9	25.1	21.6	28.7	36.4	44.6	52.2	48.9	0.6	7.6	10 36.64	− 6.84	8.94	5 10 34.54	4.1
	*−25° 21′	20	. .	. .	. .	49.0	50.5	52.2	54.1	56.1	9.2	11.8	13.7	14 59.58	7.74	8.93	5 14 42.91	1.2
	*−32° 35′	21	26.5	28.3	31.4	45.5	47.2	49.1	51.2	52.9	7.2	10 0	11.7	21 49.18	− 0.79	8.92	5 21 39.47	1.31
	*+25° 32′	22	8.3	9.7	12.4	25.7	27.2	29.0	30.7	32.8	45.9	48.7	50.5	30 29.17	+ 0.75	8.91	5 30 21.01	1.5
	α Orionis	23	21.6	23.4	25 9	37.8	39.3	41.1	42.8	44.2	56.3	58.9	0.3	48 41.05	+ 0.26	8.89	5 48 32.42	− 1.5
	δ Ursæ Minoris, S. P.	24	. .	. .	. .	. .	48.0	16.0	42.0	. .	. .	. .	. .	12 15.33	− 24.67	8.87	. . . .	+ 19.1
	B. A. C. 2069	25	54.5	2.4	14.5	12.3	19.5	27.7	35.7	43.0	41.5	52.4	59.8	21 27.57	+ 6.97	8.86	6 21 25.68	− 5.0
	49 Aurigæ	26	15.5	17.4	20.4	33.7	35.5	37.4	39.3	41.0	54.5	57.5	59.0	27 37.38	0.83	8.84	6 27 29.37	1.9
	γ Geminorum	27	26.5	28.2	30.7	43.2	44.8	46.5	48.3	50.0	2.3	5.0	6.5	30 46.55	0.50	8.85	6 30 38.20	1.8
	51 Cephei	28	. .	. .	. .	19.0	47.0	23.0	57.0	30.0	. .	. .	. .	42 23.20	30.27	8.83	. . . .	29.3
	B. A. C. 2247	29	. .	. .	. .	21.7	26.2	32.2	36.7	41.0	. .	. .	. .	47 31.56	+ 4.25	8.83	6 47 26.98	5.0
	*−14° 42′	30	. .	. .	. .	56.0	57.7	59.2	0.8	2.5	. .	. .	. .	1 59.24	− 0.29	8.81	7 1 50.14	1.7
	*−14° 42′	31	35.0	36.7	39.4	. .	. .	. .	. .	. .	10.0	13.0	15.3	2 54.90	− 0.27	8.81	7 2 45.82	1.7
	*−14° 42′	32	46.6	48.2	51.0	. .	. .	. .	. .	. .	. .	. .	. .	2 48.60	+ 17.58	8.81	7 2 57.37	1.70
	B. A. C. 2377	33	. .	. .	. .	59.9	10.0	20.5	31.4	41.5	. .	. .	. .	12 20.66	+ 9.37	8.80	7 12 20.09	10.7
	O. Arg. S. 6728	34	13.3	15.0	17.8	31.0	33.6	34.3	36.1	38.0	51.2	53.8	55.4	18 34.50	− 0.55	8.79	7 18 25.16	1.71
	*+22° 32′	35	50.3	51.8	54.4	7.6	9.1	10.7	12.6	14.3	27.2	29.7	31.6	24 10.85	+ 0.66	8.78	7 24 2.73	2.16
	*+21° 41′	36	45.8	47.5	50.2	3.1	4.6	6.4	8.1	9 8	22.8	25.5	27.1	30 6.45	0.64	8.78	7 29 58.31	2.1
	*+15° 34′	37	0.4	2.0	4.7	16.9	18.7	20.2	22.1	23.7	36.0	38.6	40.2	34 20.32	0.47	8.77	7 34 12.02	2.0
	β Geminorum	38	35.6	37.5	40.3	54.1	55.9	57.6	59.4	1.2	14.8	17.5	19.2	37 57.55	0.84	8.77	7 37 49.62	2.3
15	γ Tauri	39	35.7	37.2	39.9	52.3	53.8	55.6	57.4	58.9	11.2	13.8	15.3	12 55.55	0.06	6.93	4 12 48.68	1.0
	Lacaille 1463	40	43.2	45.3	48.0	2.5	4.2	6.3	8.2	10.0	24.3	27.0	28.9	23 6.17	+ 0.16	6.92	4 22 59.41	1.0
	*−32° 44′	41	. .	. .	. .	59.1	0.7	2.7	4.7	6.6	20.9	23.9	25.5	24 10.51	− 7.53	6.92	4 23 56.06	1.0
	*+27° 0′	42	55.2	57.0	59.7	. .	. .	. .	. .	. .	33.5	36.3	38.0	29 16.62	+ 0.05	6.91	4 29 9.76	1.1
	*+33° 31′	43	50.5	52.4	55.0	9.7	11.4	13.4	15.5	17.0	. .	. .	. .	33 5.61	+ 7.79	6.91	4 33 6.49	1.21
	*−26° 0′	44	. .	. .	. .	. .	. .	. .	15.7	18.5	20.4	22.1	24.0	36 20.14	− 37.75	6.91	4 35 35.48	1.0
	*−29° 58′	45	58.8	0.5	3.4	17.2	18.7	20.9	22.8	24.6	38.3	41.2	42.8	42 20.84	+ 0.15	6.90	4 42 14.09	1.1
	Lalande 9106	46	. .	. .	. .	5.8	7.8	10.0	12.3	14.5	. .	. .	. .	46 10.08	0.00	6.90	4 46 3.18	1.4
	*+43° 45′	47	55.3	57.5	0.8	17.4	19.4	21.7	24.2	26.3	42.9	46.2	48.5	47 21.84	+ 0.01	6.90	4 47 14.95	1.4
	*−25° 49′	48	. .	. .	. .	. .	. .	. .	22.4	24.7	26.3	28.0	30.4	52 26.36	− 37.69	6.89	4 51 41.78	1.1
	*+45° 6′	49	14.6	17.2	20.6	37.3	39.5	41.7	44.3	46.5	3.5	7.0	9.1	58 41.94	+ 0.01	6.89	4 58 35.06	1.5
	O. Arg. S. 3720	50	12.2	14.1	16.9	29.4	31.2	33.0	35.0	37.1	50.5	52.9	54.6	4 33.35	+ 0.14	− 6.88	5 4 26.61	− 1.2

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Feb. 14, 5.7	− 8.90	+ 0.067	+ 1.39	+ 0.08

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
377.														m. s.	s.	s.	h. m. s.	s.
b. 15	*+30° 22' . . .	1	47.0	49.0	52.1	5.7	7.6	9.4	11.4	13.2	27.0	29.8	31.6	8 9.44	+ 0.15	− 6.88	5 8 2.71	− 1.47
Y	*−25° 21' . . .	2	28.4	29.9	32.9	46.1	47.7	49.4	51.4	53.2	6.3	9.0	11.9	14 49.66	0.14	6.87	5 14 42.93	1.25
	*+38° 56' . . .	3	42.3	44.7	47.5	3.6	5.1	7.1	9.1	11.1	. .	. .	. .	18 58.88	+ 8.34	6.87	5 19 0.35	1.67
	*+38° 57' . . .	4	. .	. .	. .	19.8	21.6	23.8	25.9	27.9	43.2	46.5	48.4	19 32.14	− 8.31	6.87	5 19 16.96	1.69
	*+38° 58' . . .	5	8.3	10.4	13.5	28.7	30.9	33.0	35.0	37.1	52.4	54.7	57.6	21 32.87	+ 0.02	6.87	5 21 26.02	1.69
	*+38° 11' . . .	6	20.6	22.7	25.8	. .	. .	. .	. .	. .	4.3	7.7	9.4	35 45.08	0.03	6.85	5 35 38.26	1.80
	*+38° 12' . . .	7	31.8	34.0	37.2	. .	. .	. .	. .	. .	15.6	19.0	20.8	35 56.40	0.03	6.85	5 35 49.58	1.80
	*+38° 7' . . .	8	51.7	53.9	56.8	12.0	13.9	16.0	18.2	20.2	35.0	38.5	40.3	39 16.05	0.02	6.85	5 39 9.22	1.83
	B. A. C. 1860 . .	9	32.7	34.5	37.0	50.1	51.8	53.6	55.3	57.0	9.9	12.7	14.4	44 53.55	0.13	6.85	5 44 46.83	1.38
	α Orionis. . . .	10	19.7	21.4	23.9	35.9	37.4	39.1	40.8	42.3	54.4	56.9	58.4	48 39.11	0.07	6.84	5 48 32.34	1.52
	*+20° 8' . . .	11	12.2	13.9	16.5	29.3	30.9	32.7	34.4	36.0	48.5	51.3	52.8	59 32.59	+ 0.05	6.83	5 59 25.81	1.70
	*+20° 8' . . .	12	. .	. .	. .	7.6	9.0	10.6	12.3	13.8	26.5	29.2	30.8	0 17.48	− 6.85	6.83	6 0 3.80	1.70
	*+31° 26' . . .	13	. .	53.6	56.5	58.1	. .	. .	11.0	14.2	15.8	17.7	19.9	3 8.35	− 32.50	6.83	6 2 29.02	− 1.88
	δ Ursæ Minoris, S. P.	14	. .	. .	. .	. .	20.0	47.5	16.5	. .	. .	. .	. .	11 48.00	+ 0.24	6.82	. . . . .	+ 18.80
	B. A. C. 2100 . .	15	1.0	2.7	5.4	18.7	20.4	22.2	24.0	25.8	39.1	41.8	43.3	22 22.22	+ 0.14	6.81	6 22 15.55	− 1.52
	*−25° 45' . . .	16	. .	8.7	11.2	13.2	. .	. .	25.0	27.8	. .	. .	. .	23 17.18	− 25.26	6.81	6 22 45.11	1.53
	γ Geminorum . .	17	25.0	26.7	29.3	41.7	43.2	44.9	46.6	48.3	0.7	3.3	4.7	30 44.95	+ 0.05	6.80	6 30 38.20	1.82
	Weisse (2) 1043 .	18	17.0	19.3	21.5	23.6	26.6	. .	41.2	44.5	46.3	48.5	50.7	36 3.92	0.12	6.80	6 35 57.24	2.22
	Weisse (2) 1044 .	19	41.0	43.1	46.3	1.1	3.0	5.0	7.0	9.1	23.8	26.9	28.7	36 5.00	0.03	6.80	6 35 58.23	2.22
	*−28° 35' . . .	20	40.4	42.5	45.0	58.9	0.6	2.4	4.4	6.0	19.6	22.4	24.1	44 2.39	0.15	6.79	6 43 55.75	1.60
	*−24° 15' . . .	21	13.2	15.3	18.1	. .	. .	. .	. .	. .	50.6	53.0	54.7	48 34.15	0.14	6.79	6 48 27.50	1.61
	*−24° 13' . . .	22	22.0	24.0	26.7	. .	. .	. .	. .	. .	59.7	2.4	4.4	48 43.20	0.14	6.79	6 48 36.55	1.61
	*−30° 43' . . .	23	3.5	5.3	8.3	22.2	23.7	25.7	27.6	29.3	. .	. .	. .	52 18.20	+ 7.68	6.78	6 52 19.10	1.62
	B. A. C. 2317 . .	24	4.0	16.0	22.9	53.2	3.4	14.0	25.9	36.9	57.5	13.5	23.1	2 13.67	− 0.13	6.78	7 2 6.76	11.35
	*−23° 30' . . .	25	10.4	12.4	15.0	. .	. .	. .	. .	. .	48.3	50.6	52.4	10 31.52	+ 0.14	6.77	7 10 24.89	1.68
	Lacaille 2684 . .	26	25.3	26.8	29.6	. .	. .	. .	. .	. .	2.6	5.2	6.9	10 46.07	0.14	6.77	7 10 39.44	1.68
	*−35° 41' . . .	27	. .	. .	. .	54.2	56.2	58.4	0.2	2.3	. .	. .	. .	17 58.26	0.16	6.76	7 17 51.66	1.70
	*−35° 44' . . .	28	34.9	36.8	40.1	. .	. .	. .	. .	. .	17.2	20.2	22.1	17 58.55	0.18	6.76	7 17 51.97	1.70
	*+40° 42' . . .	29	11.2	13.5	16.8	32.6	34.5	36.6	38.8	40.8	56.6	59.7	1.8	22 36.63	0.02	6.76	7 22 29.89	2.65
	Weisse (2) 625 .	30	15.7	17.9	21.4	27.9	28.8	41.3	43.4	45.5	1.3	4.5	6.5	23 41.29	+ 0.02	6.75	7 23 34.56	2.65
	Weisse (2) 730 .	31	. .	. .	. .	56.8	58.6	1.0	3.2	5.3	21.1	24.4	26.4	27 9.60	− 8.66	6.75	7 26 54.19	2.71
	*−31° 3' . . .	32	32.9	34.6	37.7	51.7	53.3	55.4	57.2	58.9	. .	. .	. .	31 47.71	+ 7.71	6.75	7 31 48.67	1.73
	*−31° 3' . . .	33	. .	. .	. .	10.8	12.6	14.5	16.7	18.4	32.4	35.2	36.9	32 22.19	− 7.41	6.75	7 32 8.03	1.73
	β Geminorum . .	34	34.6	36.3	39.3	52.7	54.4	56.4	58.2	0.0	13.6	16.2	17.9	37 56.33	+ 0.04	6.74	7 37 49.63	2.35
	*+38° 9' . . .	35	35.0	37.0	40.3	55.3	57.2	59.6	1.5	3.6	18.8	21.8	23.5	42 59.42	+ 0.02	6.74	7 42 52.70	2.66
	+0° 28' . . .	36	. .	. .	. .	. .	. .	. .	33.4	35.8	37.5	39.0	40.8	46 37.30	− 33.98	6.73	7 45 56.59	1.92
	+0° 27' . . .	37	. .	. .	. .	2.8	4.1	5.7	7.5	9.0	. .	. .	. .	46 5.82	+ 0.07	6.73	7 45 59.16	1.92
	*−30° 32' . . .	38	18.4	20.5	23.4	37.2	39.0	40.8	42.7	44.5	58.5	1.4	3.0	51 40.85	0.15	6.73	7 51 34.27	1.77
	O. Arg. S. 7797 .	39	41.0	42.8	45.7	59.3	1.1	3.1	5.0	6.8	20.7	23.4	25.1	55 3.09	0.15	6.73	7 54 56.51	1.78
	O. Arg. S. 7798 .	40	48.7	50.3	53.4	. .	. .	. .	. .	. .	28.2	31.0	32.8	55 10.73	0.16	6.73	7 55 4.16	1.78
	ρ Argus	41	5.8	7.5	10.4	23.4	25.0	26.7	28.6	30.3	43.5	46.2	47.8	2 26.84	+ 0.13	6.72	8 2 20.25	1.80
	B. A. C. 2749 . .	42	13.5	18.7	27.6	7.9	13.1	18.2	24.1	29.3	10.0	17.8	22.6	7 18.44	− 0.05	6.72	8 7 11.67	6.72
17	γ Tauri	43	32.8	34.7	37.3	49.6	51.3	52.8	54.5	56.1	8.6	11.2	12.7	12 52.87	0.02	4.20	4 12 48.65	0.97
	*+17° 13' . . .	44	33.5	35.3	37.8	50.4	52.0	53.7	55.4	57.0	9.7	11.1	13.6	18 53.59	0.03	4.20	4 18 49.36	1.01
	ε Tauri	45	. .	. .	. .	27.9	29.7	31.4	33.2	34.8	47.3	50.0	51.5	21 38.22	6.90	4.19	4 21 27.13	1.04
	*+22° 4' . . .	46	. .	. .	. .	46.7	48.4	50.1	52.0	53.7	6.9	9.3	10.9	29 57.21	7.06	4.19	4 29 45.96	1.10
	*+33° 31' . . .	47	48.1	49.5	52.9	7.4	8.9	11.0	12.9	15.2	29.4	31.8	33.9	33 11.00	0.17	4.18	4 33 6.65	1.18
	*−26° 0' . . .	48	. .	. .	. .	. .	. .	. .	12.6	15.7	17.5	19.2	21.3	36 17.26	− 37.58	4.18	4 35 35.50	1.04
	*+10° 42' . . .	49	7.0	8.9	10.5	11.9	14.7	. .	32.8	35.6	37.2	38.9	41.1	41 53.86	+ 0.24	4.18	4 41 49.92	1.13
	*+10° 42' . . .	50	27.6	29.2	31.8	. .	. .	. .	. .	. .	2.5	4.9	6.4	41 47 07	+ 0.18	− 4.18	4 41 43.07	− 1.13

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Feb. 15, 6.4	− 6.81	+ 0.055	− 0.10	+ 0.08

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductio to 1877.c
1877.														m. s.	s.	s.	h. m. s.	s.
Feb. 17 Y.	*+10° 42′	1	. .		.	48.8	50.5	52.0	53.7	55.3	. .	. .	. .	41 52.06	+ 0.16	− 4.18	4 41 48.04	− 1.1
	*+10° 42′	2	. .		.	.	.	. .	15.7	18.5	20.0	22 2	24.4	42 20.16	− 34.49	4.18	4 41 41.49	1.1
	*+10° 42′	3	. .		.	.	.	. .	32.8	35.6	37.2	38.9	41.1	42 37.12	34.49	4.18	4 41 58.45	1.1
	*+10° 42′	4	. .	59 6	2.1	3 6	.	. .	14.7	17.4	18.8	20.4	22.2	43 12.35	− 28.08	4.18	4 42 40.09	1.1
	*+10° 42′	5	. .		.	45 6	47 0	48.6	50.5	52.2	. .	. .	.	43 48.82	+ 0.16	4.18	4 43 44.80	1.1
	Weisse 926	6	9.1	10 9	3.5	25 7	27 4	28.9	30.5	32.2	44.4	46.9	48.4	44 28.90	0.17	4.17	4 44 24.90	1.1
	*+45° 6′	7	12.5	14.5	7.9	35 4	37 2	39.7	. .	. .	. .	. .	.	58 26.20	13.07	4.16	4 58 35.11	1.5
	Weisse 56	8	0.7	.2	4.7	.	.	. .	. .	. .	35.3	37.7	39.2	5 19.97	0.05	4.16	5 5 15.86	1.2
	Weisse 55	9	. .	.	.	17 2	18 7	20.2	21.9	23.7	. .	.	.	5 20.34	+ 0.03	4.16	5 5 16.21	1.2
	*+30° 22′	10	. .	.	.	3 2	4 9	6.9	8.9	10.9	. .	. .	. .	8 6.96	− 0.14	4.16	5 8 2.66	1.4
	*−25° 21′	11	25.4	2 .0	29.9	43 0	44 6	46.6	48.5	50.3	3.5	5.8	7.5	14 46.55	+ 0.29	4.15	5 14 42.69	1.2
	*+38° 44′	12	43.2	45 4	48.7	3 9	5 7	7.8	9.7	12.0	27.6	30.5	32.3	21 7.89	− 0.22	4.14	5 21 3.53	1.6
	*−13° 36′	13	46.8	48 4	51.2	3 2	4 8	6.6	8.2	9.7	22.0	24.7	26.2	28 6.53	+ 0.20	4.14	5 28 2.59	1.3
	*+70° 18′	14	36.6	4 0	47.4	.	.	. .	. .	. .	. .	.	. .	32 41.67	+ 50.37	4.13	5 33 27.91	3.2
	O. Arg. N. 6082	15	. .	.	. .	37 1	41 5	46.4	51.5	56.2	. .	.	.	33 46.54	− 0.91	4.13	5 33 41.50	3.2
	*+38° 7′	16	31.5	33 8	37.0	52 2	54 0	56.0	58.1	0.3	15.5	18.6	20.6	37 56.15	0.21	4.13	5 37 51.81	1.7
	*+38° 7′	17	. .	.	. .	38 8	40 7	43.0	44.9	47.1	. .	.	.	38 42.90	0.22	4.13	5 38 38.55	1.8
	*+38° 7′	18	. .	.	. .	9.7	11.6	13.8	15.7	17.9	. .	.	.	39 13.74	− 0.22	4.13	5 39 9.39	1.8
	Lacaille 2023	19	37.8	39 5	42.4	55.6	57.2	59.0	0.9	2.7	15.8	18.5	20.3	46 59.06	+ 0.30	4.12	5 46 55.24	1.3
	*−29° 56′	20	14.4	16 7	18.8	20 7	23 3	. .	32.7	35.9	37.8	39.8	41.9	50 58.20	0.42	4.12	5 50 54.50	1.3
	*−29° 56′	21	38.3	40 1	42.8	56 3	58.4	0.1	1.8	3.9	17.7	20.7	2 5	51 0.24	+ 0.34	4.12	5 50 56.46	1.3
	*+37° 58′	22	48.0	49 8	52.8	8 2	9.9	12 .	4 5	16.5	31.4	34.5	36 5	0 12.20	− 0.21	4.11	6 0 7.88	1.9
	*−26° 42′	23	. .		.	49 1	50.8	52 8	54 7	56.8	. .	. .	. .	6 52.84	+ 0.30	4.10	6 6 49.04	1.4
	*−26° 42′	24	. .	13 5	6 4	18 1	. .	.	29 9	33.2	35.0	36.9	38 9	7 27.74	− 30.76	4.10	6 6 52.88	− 1.4
	δ Ursæ Minoris, S. P.	25	. .	. .	. .	47 0	13.0	41 5	8 5	35.0	. .	. .	. .	11 41.00	+ 5.60	4.10	. . . .	+ 18.1
	Weisse 428	26	. .	. .	. .	41.0	42.6	44 2	46 0	47.6	59.8	2.6	4 0	15 50.98	− 6.49	4.10	6 15 40.39	− 1.5
	*−25° 45′	27	27.3	29.3	32.0	45.4	47.2	49.0	50.7	52.5	6.0	8.4	10 2	22 48.91	+ 0.30	4.09	6 22 45.12	1.5
	O. Arg. S. 5176	28	53.9	55.7	58.5	11.6	13.2	15 2	17.0	18.9	32.2	34.9	36 6	24 15.25	+ 0.30	4.09	6 24 11.46	1.5
	γ Geminorum	29	22.2	24.0	26.7	39.2	40.7	42 5	44.2	45.8	58.2	0.7	2 4	30 42.42	− 0.03	4.08	6 30 38.31	1.8
	42 Camelopardi	30	25.7	29.9	36.5	7.6	11.7	16 2	20.7	24.7	56.1	2.5	6 8	38 16.22	0.76	4.08	6 38 11.38	4.1
	B. A. C. 2210	31	51.9	59.2	9.8	3.8	10.6	17 9	25.6	32.3	26.1	37.0	43 5	42 17.97	1.39	4.07	6 42 12.51	6.7
	*−38° 50	32	. .	45.2	49.2	50.9	4.0	7 3	8.9	11.4	13.3	. .	. .	50 1.28	35.84	4.07	6 49 21.37	1.5
	B. A. C. 2317	33	3.6	14.7	31.8	51.8	2.0	13 4	24.5	34.7	55.5	12.0	22 5	2 13.32	2.13	4.06	7 2 7.13	10.5
	δ Geminorum	34	31.9	33.8	36.6	49.4	51.0	52 9	54.5	56.4	9.3	11.9	13 4	12 52.83	− 0.07	4.05	7 12 48.71	2.1
	*−24° 41′	35	. .	.	. .	4.4	5.9	7.4	9.0	11.0	. .	. .	. .	16 7.54	+ 0.28	4.05	7 16 3.77	1.6
	O. Arg. S. 6696	36	1.3	3 0	5.7	18.9	20.6	22.4	24.2	25.9	39.2	41.8	43 4	17 22.40	0.29	4.04	7 17 18.65	1.6
	*−14° 46′	37	19.3	2 1	23.7	36.2	37.7	39.3	41.1	42.6	55.0	57.4	59 0	23 39.31	+ 0.21	4.04	7 23 35.48	1.7
	Weisse (2) 730	38	32.5	34 8	38.3	54.2	56.2	58.3	0.4	2.8	18.7	22.3	24 3	26 58.44	− 0.25	4.05	7 26 54.15	2.7
	*−31° 3′	39	30.1	32 0	34.8	48.5	50.5	52.4	54.3	56.1	. .	. .	. .	31 44.84	+ 7.91	4.03	7 31 48.72	1.7
	*−31° 3′	40	. .	. .	. .	8.2	9.9	11.8	13.6	15.5	29.5	32.0	34.0	32 19.31	− 7.20	4.03	7 32 8.08	1.7
	β Geminorum	41	32.0	33.7	36.6	50.0	51.8	53.6	55.6	57.5	11.0	13.6	15.4	37 53.71	− 0.12	4.03	7 37 49.56	2.3
19	78 Eridani	42	25.1	26.9	29.7	42.8	44.4	46.4	48.2	49.9	3.0	5.7	7.4	48 46.32	+ 0.22	16.98	3 48 29.56	0.7
	γ¹ Eridani	43	15.3	17.0	19.7	32.0	33.5	35.2	36.8	38.4	50.7	53.3	54.8	52 35.15	+ 0.16	16.97	3 52 18.34	0.8
	A¹ Tauri	44	23.5	25.2	27.0	39.9	4 5	43.2	45.0	46.6	59.5	2.2	3.8	57 43.40	− 0.01	16.97	3 57 26.42	0.8
	A² Tauri	45	. .	. .	. .	17.7	19 4	21.1	22 8	24.7	37.4	40.1	41.7	58 28.11	6.98	16.97	3 58 4.16	0.8
	ω¹ Tauri	46	57.4	59.0	2.0	14.4	16.1	17.8	19.6	21.2	34.0	36.5	38.0	2 17.82	− 0.00	16.97	4 2 0.85	0.8
	46 Tauri	47	54.2	55.8	58.5	10.4	1 8	13.5	15.3	16.8	28.8	31.2	32.8	7 13.55	+ 0.06	16.97	4 6 56.64	0.8
	γ Tauri	48	45.6	47.4	49.9	2.2	3 8	5.4	7.2	8.9	21.1	23.8	25.3	13 5.51	0.02	16.96	4 12 48.57	0.9
	B. A. C. 1374	49	17.2	19.2	22.4	37.0	38.7	40.8	42.8	44.7	59.2	2.2	4.1	20 40.76	0.30	16.96	4 20 24.10	0.9
	α Tauri	50	49.7	51.4	54.0	6.5	8.0	9.7	11.6	13.1	25.5	28.1	29.7	29 9.75	+ 0.02	−16.95	4 28 52.82	− 1.0

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Feb. 17, 6.0	− 4.11	+ 0.051	− 0.41	+ 0.09

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
77. . 19	Weisse 725	1	30.5	32.1	34.6	46.6	48.1	49.8	51.5	53.3	5.0	7.4	9.1	34 49.82	+ 0.05	−16.95	4 34 32.92	− 1.05
.	*+10° 42′	2	16.5	18.3	20.1	22.1	24.8	. .	. .	. .	. .	. .	. .	41 20.36	34.84	16.94	4 41 38.26	1.10
	*+10° 42′	3	38.7	40.1	42.7	. .	. .	. .	. .	. .	13.6	15.7	17.5	41 58.05	0.05	16.94	4 41 41.16	1.10
	*+10° 42′	4	. .	. .	. .	36.4	58.0	59.6	1.4	3.0	. .	. .	. .	41 59.70	+ 0.03	16.94	4 41 42.79	1.10
	*+10° 42′	5	. .	. .	. .	. .	. .	. .	. .	. .	20.0	22.6	24.0	42 22.20	− 17.53	16.94	4 41 47.73	1.11
	*+10° 42′	6	. .	. .	. .	53.2	55.1	56.8	58.4	0.4	. .	. .	. .	42 56.78	+ 0.03	16.94	4 42 39.87	1.11
	*+10° 42′	7	. .	12.2	14.8	16.3	. .	. .	27.5	30.1	31.8	33.6	35.7	43 25.25	− 28.21	16.94	4 42 40.10	1.11
	Weisse 926	8	21.9	23.7	26.3	38.3	39.9	41.6	43.2	44.8	57.0	59.3	1.0	44 41.55	+ 0.04	16.94	4 44 24.65	1.12
	*−23° 48′	9	17.0	18.8	21.6	34.5	36.0	38.1	39.8	41.6	54.6	57.3	59.0	0 38.03	0.21	16.93	5 0 21.31	1.12
	*−25° 33′	10	5.1	7.3	10.3	20.6	22.9	25.1	27.3	29.2	43.8	46.4	47.9	6 25.08	+ 0.22	16.93	5 6 8.37	1.14
	B. A. C. 1641	11	16.2	18.2	21.5	35.9	37.6	39.6	41.7	43.7	58.2	1.4	3.1	11 39.74	+ 0.30	16.92	5 11 23.12	1.16
	ο Columbæ	12	. .	39.4	42.0	44.0	. .	. .	57.4	0.5	2.5	4.6	6.7	13 54.64	− 33.58	16.92	5 13 4.14	1.17
	*+77° 50′	13	. .	. .	. .	11.7	18.9	26.2	34.9	41.9	. .	. .	. .	17 26.72	− 0.79	16.92	5 17 9.01	4.01
	*−32° 29′	14	11.2	13.2	16.3	30.4	31.9	33.8	35.8	37.7	51.7	54.8	56.6	23 33.95	+ 0.28	16.91	5 23 17.32	1.21
	*− 5° 36′	15	. .	. .	. .	4.8	6.3	7.8	9.4	11.1	. .	. .	. .	28 7.88	− 0.13	16.91	5 27 50.84	1.29
	*+25° 56′	16	. .	. .	. .	29.7	31.2	33.2	35.0	36.9	50.0	52.8	54.5	30 40.31	7.23	16.91	5 30 16.17	1.52
	*+38° 11′	17	30.8	32.7	36.2	. .	. .	. .	. .	. .	14.6	17.6	19.5	35 55.23	0.08	16.90	5 35 38.25	1.73
	*+38° 13′	18	42.2	44.1	47.4	. .	. .	. .	. .	. .	26.0	28.9	30.8	36 6.57	− 0.08	16.90	5 35 49.59	1.74
	*−29° 56′	19	27.6	29.5	31.7	33.3	36.5	. .	46.1	48.8	50.7	52.7	54.8	51 11.17	+ 0.33	16.90	5 50 54.60	1.33
	*−29° 54′	20	50.4	52.5	55.4	9.1	11.0	12.9	14.7	16.6	30.2	32.9	34.7	51 12.76	+ 0.25	16.89	5 50 56.12	1.33
	B. A. C. 1935	21	30.8	32.8	36.2	51.2	53.1	55.3	57.4	59.3	14.4	17.7	19.5	56 55.24	− 0.09	16.89	5 56 38.26	1.91
	*+37° 58′	22	0.5	2.3	5.2	20.5	22.6	24.8	27.1	28.9	. .	. .	. .	0 16.49	+ 8.12	16.89	6 0 7.72	1.93
	*−26° 42′	23	. .	. .	. .	2.5	4.1	6.1	8.0	10.0	. .	. .	. .	7 6.14	0.22	16.88	6 6 49.48	1.40
	*−26° 42′	24	27.0	29.0	31.2	32.9	35.7	. .	43.0	45.9	47.8	49.5	51.5	7 9.35	+ 0.31	16.88	6 6 52.78	1.40
	B. A. C. 2021	25	35.4	37.2	40.3	55.0	56.7	58.7	0.9	2.9	17.4	20.4	22.0	10 58.81	− 0.07	16.88	6 10 41.86	1.96
	Weisse 446	26	2.7	4.4	7.0	19.3	20.7	22.5	24.1	25.8	38.2	40.6	42.4	16 22.52	+ 0.16	16.88	6 16 5.80	1.47
	*−25° 45′	27	58.5	0.1	2.1	3.9	5.7	. .	34.7	37.3	38.8	41.0	43.1	23 20.52	− 18.68	16.87	6 22 44.97	1.46
	γ Geminorum	28	35.1	36.7	39.4	51.6	53.2	55.0	56.8	58.4	10.9	13.4	15.0	30 55.05	+ 0.02	16.87	6 30 38.20	1.78
	51 Cephei	29	. .	. .	. .	57.0	30.0	3.0	40.0	10.5	. .	. .	. .	43 4.10	− 3.70	16.86	. . . .	27.69
	*−38° 50′	30	. .	. .	. .	34.0	36.0	38.1	40.1	41.8	. .	. .	. .	49 38.00	+ 0.32	16.86	6 49 21.46	1.56
	*−20° 26′	31	. .	46.5	49.6	51.7	. .	. .	1.5	4.6	6.9	9.0	11.2	57 0.12	− 29.43	16.85	6 56 13.84	1.60
	B. A. C. 2317	32	16.0	26.4	43.6	4.4	14.3	25.5	36.4	47.0	7.6	24.3	33.6	2 25.37	1.13	16.85	7 2 7.39	10.42
	δ Geminorum	33	44.8	46.5	49.2	2.1	3.7	5.5	7.2	8.9	21.8	24.4	26.1	13 5.47	− 0.01	16.84	7 12 48.62	2.08
	*−24° 41′	34	59.6	1.3	4.1	17.4	19.0	20.9	23.0	24.8	. .	. .	. .	16 13.76	+ 7.34	16.84	7 16 4.26	1.65
	O. Arg. S. 6696	35	. .	. .	. .	31.8	33.3	35.3	37.1	39.0	52.0	54.7	56.3	17 42.41	− 6.91	16.84	7 17 18.69	1.66
	O. Arg. S. 6728	36	20.4	22.2	25.0	38.0	39.8	41.6	43.3	45.0	58.2	0.9	3.0	18 41.58	+ 0.22	16.83	7 18 24.97	1.66
	*−14° 46′	37	32.3	33.7	36.4	48.7	50.3	52.2	53.8	55.4	7.7	10.0	11.7	23 52.02	+ 0.16	16.83	7 23 35.35	1.72
	Lalande 14619	38	. .	20.1	22.8	24.3	. .	. .	35.4	38.1	39.6	41.5	43.5	24 33.16	− 28.54	16.83	7 23 47.79	1.72
	Weisse (2) 840.	39	54.5	56.1	58.8	11.6	13.3	14.9	16.8	18.5	31.4	33.9	35.6	30 15.04	− 0.01	16.83	7 29 58.20	2.14
	*−14° 21′	40	52.2	53.9	56.5	8.8	10.3	12.2	13.9	15.7	27.9	30.4	31.9	35 12.15	+ 0.16	16.82	7 34 55.19	1.75
	Lalande 15079	41	11.4	13.0	15.7	27.7	29.2	31.0	32.6	34.2	46.5	48.8	50.5	38 30.96	0.14	16.82	7 38 14.28	1.78
	*+ 0° 30′	42	19.0	20.5	23.2	. .	. .	. .	. .	. .	53.3	55.9	57.4	47 38.22	0.10	16.81	7 47 21.51	1.91
	*−30° 32′	43	28.3	30.4	33.3	47.1	49.0	50.9	52.7	54.6	8.5	11.4	13.0	51 50.84	+ 0.26	16.81	7 51 34.29	1.74
	*−30° 1′	44	. .	. .	. .	20.3	22.0	23.9	25.9	27.7	41.4	43.9	45.9	54 31.37	− 7.23	16.81	7 54 7.33	1.74
	O. Arg. S. 7797	45	. .	. .	. .	9.2	11.2	13.1	15.1	16.9	. .	. .	. .	55 13.10	+ 0.24	16.81	7 54 56.53	1.75
	O. Arg. S. 7798	46	. .	38.2	41.0	42.8	. .	. .	55.1	58.5	0.2	2.0	4.3	55 52.76	− 31.83	16.81	7 55 4.12	1.75
	ρ Argus	47	15.7	. .	20.4	33.5	35.0	36.9	38.7	40.4	53.4	. .	57.7	2 36.86	+ 0.21	16.81	8 2 20.26	1.77
21	B. A. C. 2749	48	23.9	29.1	37.8	18.0	23.3	28.5	34.6	39.9	20.3	28.4	33.4	7 28.84	− 0.53	16.80	8 7 11.51	6.65
	ε Tauri	49	. .	51.0	53.6	6.1	7.5	9.3	11.0	12.7	25.0	27.8	. .	29 9.33	+ 0.04	16.56	4 28 52.81	1.01
	*+10° 42′	50	35.2	36.8	39.6	. .	. .	. .	. .	. .	10.4	13.4	15.9	41 55.22	+ 0.08	−16.55	4 41 38.75	− 1.07

CORRECTIONS, &c.

Date.		Error of clock.	Hourly rate.	*n*	*c*
1870.	h.	s.	s.	s.	s.
Feb. 19,	5.7	− 16.90	+ 0.041	− 0.26	+ 0.09

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductic to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1877. Feb. 21 Y.	*+10° 42′ . . .	1	. .	. .	. .	56.1	57.7	59.3	0.9	2.6	. .	. .	. .	41 59.32	+ 0.06	−16.55	4 41 42.83	− 1.0
	*+10° 42′ . . .	2	43.7	46.0	49.0	. .	. .	. .	. .	. .	19.8	22.2	24.0	42 4.12	+ 0.08	16.55	4 41 47.65	1.0
	*+10° 43′ . . .	3	. .	. .	. .	. .	. .	. .	32.5	35.0	36.8	38.4	40.5	42 36.64	− 34.59	16.55	4 41 45.50	1.0
	Weisse 925 . .	4	. .	. .	. .	21.6	23.2	24.9	26.5	28.1	40.2	42.5	44.0	44 31.37	− 6.39	16.55	4 44 8.43	1.0
	ε Aurigæ . . .	5	0.0	2.1	5.8	22.2	24.5	26.5	28.8	31.1	47.6	50.9	53.0	53 26.59	+ 0.03	16.54	4 53 10.08	1.3
	*−23° 48′ . . .	6	17.0	18.7	21.2	34.6	36.1	37.9	39.3	41.4	54.6	57.0	58.5	0 37.85	0.14	16.53	5 0 21.46	1.0
	O. Arg. S. 3720 .	7	22.1	23.8	27.0	. .	. .	. .	. .	. .	0.1	2.5	4.2	4 43.28	+ 0.16	16.53	5 4 26.91	1.1
	*−25° 36′ . . .	8	. .	. .	. .	. .	. .	. .	. .	. .	50.5	52.9	54.8	5 52.73	− 18.99	16.53	5 5 17.21	1.1
	B. A. C. 1619 . .	9	. .	. .	. .	35.8	43.6	51.0	58.8	6.9	. .	. .	. .	10 51.22	0.09	16.52	5 10 34.61	3.6
	Weisse (2) 430 .	10	. .	. .	. .	27.8	29.6	31.7	33.7	35.8	51.1	54.1	55.8	17 39.95	− 8.18	16.52	5 17 15.25	1.5
	Weisse (2) 431 .	11	43.8	46.3	48.4	50.5	53.6	. .	10.0	13.3	15.2	17.5	20.0	17 31.86	+ 0.12	16.52	5 17 15.46	1.5
	*+54° 35′ . . .	12	9.3	12.2	16.3	37.0	39.7	42.6	45.0	48.0	8.5	13.1	15.5	21 42.47	0.01	16.52	5 21 25.96	1.9
	δ Orionis . . .	13	41.8	43.5	46.0	57.9	59.4	1.1	2.9	4.4	16.2	18.7	20.2	26 1.10	0.09	16.51	5 25 44.68	1.2
	Weisse 603 . .	14	23.2	25.0	26.8	28.4	31.0	. .	31.1	33.6	35.3	37.0	38.9	26 1.03	0.16	16.51	5 25 44.68	1.2
	ε Orionis. . . .	15	56.9	58.6	1.0	12.9	14.4	16.1	17.7	19.4	31.2	33.7	35.3	30 16.11	0.09	16.51	5 29 59.69	1.3
	*+38° 11′ . . .	16	30.2	32.5	35.8	. .	. .	. .	. .	. .	13.9	17.1	19.0	35 54.75	+ 0.05	16.50	5 35 38.30	1.7
	*+38° 13′ . . .	17	. .	. .	. .	1.9	4.1	6.0	8.2	9.9	25.2	28.5	30.2	36 14.25	− 8.21	16.50	5 35 49.54	1.7
	*+38° 7′ . . .	18	43.9	46.0	49.1	4.3	5.9	8.1	10.2	12.0	27.5	30.4	32.3	38 8.15	+ 0.04	16.50	5 37 51.69	1.7
	*+20° 17′ . . .	19	44.0	45.6	48.4	. .	. .	. .	. .	. .	20.7	23.4	24.8	46 4.48	0.07	16.49	5 45 48.06	1.5
	B. A. C. 1867 . .	20	57.9	59.8	2.2	. .	. .	. .	. .	. .	34.4	37.0	38.7	46 18.33	0.07	16.49	5 46 1.91	1.5
	*−32° 0′ . . .	21	8.7	10.7	13.6	27.5	29.4	31.3	33.4	35.2	49.2	52.1	53.8	52 31.35	0.17	16.49	5 52 15.03	1.3
	*+20° 8′ . . .	22	59.5	1.4	3.9	16.8	18.3	20.1	21.8	23.7	36.1	38.9	40.7	0 20.11	+ 0.06	16.48	6 0 3.69	1.6
	*+20° 12′ . . .	23	. .	. .	. .	53.3	56.0	57.7	9.3	12.1	13.7	15.6	17.5	1 6.90	− 29.52	16.48	6 0 20.90	1.6
	*+31° 26′ . . .	24	22.8	24.9	27.0	41.8	43.6	45.6	47.6	49.4	3.4	6.1	7.9	2 45.46	+ 0.04	16.48	6 2 29.02	1.8
	*+31° 23′ . . .	25	. .	. .	. .	19.8	22.6	24.6	37.3	40.3	42.3	43.2	46.4	3 34.56	− 32.47	16.48	6 2 45.61	− 1.8
	δ Ursæ Minoris . .	26	. .	. .	. .	5.0	31.5	59.5	28.0	54.0	. .	. .	. .	11 59.60	− 0.05	16.47	. . . .	+ 17.0
	B. A. C. 2100 . .	27	10.5	12.5	15.2	28.3	30.1	32.0	33.8	35.5	. .	. .	. .	22 24.74	+ 7.17	16.46	6 22 15.45	1.4
	*−25° 45′ . . .	28	. .	. .	. .	57.2	58.7	1.3	3.3	5.2	18.5	20.9	23.0	23 8.51	− 6.88	16.46	6 22 45.17	1.4
	*−25° 48′ . . .	29	. .	. .	. .	. .	. .	. .	34.9	37.6	39.6	41.4	43.3	23 38.36	− 36.79	16.46	6 22 45.11	1.4
	O. Arg. S. 5176 .	30	6.4	8.2	10.8	24.3	25.9	27.8	29.5	31.4	44.6	47.4	49.0	24 27.75	+ 0.15	16.46	6 24 11.44	1.4
	49 Aurigæ. . . .	31	. .	. .	. .	41.9	43.7	45.4	47.4	49.2	2.7	5.4	7.1	27 52.85	− 7.30	16.46	6 27 29.09	1.9
	*−32° 4′ . . .	32	. .	. .	. .	0.4	2.6	5.5	18.1	20.1	23.2	24.9	27.0	33 15.22	− 32.58	16.45	6 32 26.19	1.4
	Weisse (2) 1043 .	33	50.0	51.9	55.0	9.8	11.7	13.7	15.8	17.7	32.5	35.6	37.3	36 13.73	+ 0.04	16.45	6 35 57.32	2.1
	Weisse (2) 1044 .	34	27.7	30.1	32.2	34.4	. .	. .	. .	55.3	57.1	59.0	1.6	36 14.67	+ 0.14	16.45	6 35 58.36	2.1
	B. A. C. 2210 . .	35	2.8	9.8	21.0	14.5	21.4	28.5	35.9	43.5	36.4	48.2	55.5	42 28.86	− 0.01	16.44	6 42 12.38	6.5
	Groom. 1241 . .	36	3.5	5.3	8.6	23.8	25.8	28.0	29.9	31.8	47.0	50.2	52.1	47 27.82	+ 0.04	16.44	6 47 11.42	2.2
	*−14° 44′ . . .	37	46.5	47.9	50.4	. .	. .	. .	. .	. .	21.9	24.4	25.9	2 6.17	+ 0.13	16.43	7 1 49.87	1.6
	*−14° 44′ . . .	38	53.6	55.2	57.9	. .	. .	. .	44.8	47.2	49.1	50.8	53.1	3 28.96	− 15.19	16.43	7 2 57.34	1.6
	*−14° 44′ . . .	39	22.7	24.5	27.0	39.4	41.0	42.8	44.5	46.1	58.3	0.9	2.4	7 42.69	+ 0.12	16.42	7 7 26.39	1.6
	*−23° 29′ . . .	40	20.5	22.3	25.0	. .	. .	. .	. .	. .	57.8	0.4	2.1	10 41.35	0.15	16.42	7 10 25.08	1.61
	Lacaille 2684 . .	41	34.9	36.6	39.3	. .	. .	. .	. .	. .	12.3	15.0	16.5	10 55.77	0.15	16.42	7 10 39.50	1.61
	Weisse (2) 730 .	42	44.8	47.0	50.1	6.3	8.1	10.5	12.7	15.1	30.8	34.2	36.2	27 10.53	0.03	16.40	7 26 54.16	2.6
	Weisse (2) 840 .	43	53.9	55.6	58.4	11.3	12.8	14.7	16.4	18.0	31.0	33.7	35.2	30 14.64	0.06	16.40	7 29 58.30	2.1
	Weisse (2) 874 .	44	57.6	59.3	2.1	14.5	16.4	18.4	20.2	22.0	34.4	37.1	38.8	31 18.25	0.06	16.40	7 31 1.91	2.1
	β Geminorum . .	45	44.1	46.1	48.7	2.1	4.1	6.0	7.8	9.5	23.0	25.8	27.7	38 5.90	0.05	16.39	7 37 49.56	2.3
	*+38° 20′ . . .	46	24.9	27.1	30.5	45.6	47.6	49.4	51.5	53.4	8.8	12.0	13.8	41 49.51	0.04	16.39	7 41 33.16	2.6
	φ Geminorum . .	47	55.2	57.1	59.9	13.1	15.0	16.0	18.6	20.4	33.9	36.6	38.2	46 16.81	+ 0.05	−16.38	7 46 0.48	2.3
Mar. 15	α Orionis. . . .	48	11.6	13.0	15.5	27.6	29.3	30.8	32.5	34.1	46.1	48.6	50.3	48 30.85	− 0.13	+ 1.26	5 48 31.98	− 1.1
	δ Ursæ Min., S. P. .	49	24.0	50.0	32.0	53.0	19.0	46.0	14.0	41.0	2.0	42.0	9.0	11 46.55	+ 2.97	1.24	. . . .	+ 9.6
	γ Geminorum . .	50	16.7	18.4	20.9	33.2	34.9	36.7	38.5	40.1	52.6	55.0	56.8	30 36.71	− 0.14	+ 1.23	6 30 37.80	− 1.4

CORRECTIONS, &c.

Date.		Error of clock.	Hourly rate.	n	c
1877.	h.	s.	s.	s.	s.
Feb. 21,	6.2	− 16.47	+ 0.054	− 0.10	+ 0.09

March 15. Image 0s.00, clamp west.
Image west 0 .24. clamp east.

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
77.														m. s.	s.	s.	h. m. s.	s.
r. 15	*−23° 22′ . . .	1	. .	. .	. .	49.5	51.0	52.9	54.6	56.3	. .	. .	. .	37 52.86	− 0.14	+ 1.22	6 37 53.94	− 1.11
Y.	*−23° 22′ . . .	2	. .	. .	. .	55.9	57.8	59.5	1.2	2.9	. .	. .	. .	38 59.46	0.15	1.22	6 39 0.53	1.11
	B. A. C. 2210 . .	3	. .	. .	. .	56.4	3.1	10.5	18.2	25.1	. .	. .	. .	42 10.66	0.79	1.22	6 42 11.09	4.85
	B. A. C. 2247 . .	4	26.9	31.2	38.8	15.2	20.4	25.3	30.5	34.9	11.6	19.3	24.1	47 25.29	0.51	1.21	6 47 26.00	3.70
	B. A. C. 2317 . .	5	. .	. .	. .	43.5	54.2	5.2	15.5	26.6	. .	. .	. .	2 5.50	1.14	1.20	7 2 5.56	7.83
	*+41° 45′ . . .	6	8.4	10.2	13.9	30.0	31.9	34.0	36.3	38.3	51.2	57.9	59.9	9 34.09	0.22	1.19	7 9 35.06	2.17
	*−14° 38′ . . .	7	. .	. .	. .	8.6	10.5	12.5	14.1	15.7	. .	. .	. .	17 12.28	9.10	1.19	7 17 13.37	1.37
	*−20° 32′ . . .	8	46.2	47.8	50.5	3.2	4.8	6.7	8.4	9.9	22.7	25.5	27.3	25 6.64	0.10	1.18	7 25 7.72	1.35
	Weisse (2) 840. .	9	36.4	38.0	40.6	53.6	55.3	56.9	58.7	0.4	13.2	15.8	17.6	29 56.95	0.15	1.17	7 29 57.97	1.87
	*+10° 24′ . . .	10	1.3	3.0	5.5	17.6	19.1	20.8	22.3	23.8	36.1	38.5	40.1	34 20.74	0.13	1.17	7 34 21.78	1.72
	O. Arg. S. 7296 .	11	5.8	7.5	10.5	24.3	26.1	28.0	29.9	31.6	45.5	48.2	50.2	37 27.96	0.10	1.17	7 37 29.03	1.33
	*−29° 50′ . . .	12	35.9	37.6	40.3	54.3	55.7	57.6	59.6	1.5	15.3	17.9	20.0	42 57.79	0.10	1.16	7 42 58.85	1.36
	φ Geminorum . .	13	37.5	39.4	42.2	55.5	57.3	59.0	0.9	2.5	16.2	19.0	20.8	45 59.12	0.17	1.16	7 46 0.11	2.08
	*+60° 45′ . . .	14	21.5	24.2	29.1	54.2	57.0	0.6	3.7	7.0	31.4	36.5	39.6	52 0.44	0.35	1.15	7 52 1.24	3.59
	*+28° 57′ . . .	15	18.8	20.5	23.4	37.1	38.7	40.7	42.6	44.4	58.2	1.0	2.6	59 40.73	0.17	1.14	7 59 41.70	2.09
	Weisse (2) 1642 .	16	21.8	23.5	26.0	39.8	41.5	43.6	45.5	47.2	0.7	3.5	5.4	0 43.50	0.10	1.14	8 0 44.54	2.20
	B. A. C. 2732 . .	17	29.0	31.7	36.4	58.3	1.0	3.8	7.0	9.8	31.6	35.9	39.3	4 3.98	0.31	1.14	8 4 4.81	3.39
	Lacaille 3249 . .	18	48.2	49.7	52.4	5.8	7.3	9.3	11.1	12.7	26.1	29.0	30.7	13 9.30	0.10	1.13	8 13 10.33	1.52
	*+40° 21′ . . .	19	47.9	51.0	53.2	55.0	58.3	. .	17.1	20.5	22.5	24.8	27.3	18 7.76	0.31	1.13	8 18 8.58	2.64
	Weisse (2) 382 .	20	12.9	15.2	18.4	33.6	36.0	38.4	40.5	42.5	57.9	1.3	3.5	18 38.20	0.21	1.13	8 18 39.12	2.65
	Weisse (2) 438. .	21	11.7	13.7	16.8	32.5	34.5	36.7	38.8	40.5	56.5	59.8	1.8	20 36.66	0.21	1.13	8 20 37.58	2.66
	Weisse (2) 579. .	22	2.7	4.6	7.2	21.3	23.2	25.3	27.0	28.9	42.8	45.4	47.5	26 25.08	0.18	1.12	8 26 26.02	2.39
	Weisse 792 . .	23	25.0	26.6	29.1	41.1	42.7	44.3	45.9	47.5	59.5	2.0	3.7	31 44.31	0.13	1.12	8 31 45.30	1.94
	Weisse 885 . .	24	. .	. .	. .	36.2	37.7	39.5	41.2	42.7	55.0	57.7	59.3	34 46.16	6.79	1.11	8 34 40.48	1.70
	O. Arg. S. 8946 .	25	46.6	48.4	51.1	4.6	6.2	8.0	10.1	12.1	25.3	27.7	29.6	40 8.15	− 0.10	1.11	8 40 9.16	1.62
	Lacaille 3574 . .	26	2.7	4.5	7.3	21.4	23.2	25.3	27.2	29.0	. .	. .	. .	47 17.58	+ 7.54	1.10	8 47 26.22	1.62
	*−32° 6′ . . .	27	. .	. .	. .	44.7	47.6	48.3	50.4	52.2	6.4	9.3	11.3	47 56.27	− 7.74	1.10	8 47 49.63	1.62
	B. A. C. 3042 . .	28	. .	. .	. .	32.3	43.7	54.4	4.8	15.8	. .	. .	. .	52 54.20	1.12	1.10	8 52 54.18	11.99
	O. Arg. S. 9450 .	29	11.4	12.8	15.5	28.2	30.1	31.9	33.8	35.4	48.3	50.7	52.6	6 31.88	0.10	1.08	9 6 32.86	1.74
	B. A. C. 3182 . .	30	41.7	44.0	47.6	6.2	8.7	11.0	14.0	16.3	34.7	38.7	41.2	14 11.28	0.24	1.08	9 14 12.12	3.45
	Lacaille 3815 . .	31	. .	. .	. .	19.8	21.7	23.7	25.9	27.8	43.0	46.3	48.5	19 32.09	8.42	1.07	9 19 24.74	1.71
	B. A. C. 3255 . .	32	45.8	47.4	50.3	3.8	5.4	7.5	9.5	11.2	24.7	27.6	29.3	26 7.50	0.17	1.07	9 26 8.40	2.60
	B. A. C. 3275 . .	33	2.4	9.6	21.0	23.3	30.6	39.1	47.1	54.4	56.4	8.4	17.3	31 39.05	0.89	1.06	9 31 39.22	10.14
	ε Leonis	34	32.8	34.5	37.0	50.3	51.9	53.7	55.5	57.0	10.2	13.0	14.7	38 53.69	0.16	1.06	9 38 54.59	2.52
	μ Leonis	35	26.6	28.0	30.7	44.0	45.9	47.7	49.5	51.1	4.3	7.4	9.2	45 47.67	0.16	+ 1.05	9 45 48.56	2.60
20	51 Cephei	36	. .	. .	. .	. .	. .	. .	. .	7.5	14.0	7.0	41.0	47 47.38	4 52.27	−23.40	. . . .	16.93
	δ Canis Majoris .	37	26.8	8.	31.0	44.5	46.2	48.0	49.9	51.6	4.9	7.6	9.5	3 48.04	0.04	23.39	. . . .	1.11
	O. Arg. S. 6728 .	38	. .	.	. .	43.6	45.0	47.0	49.0	51.0	. .	. .	. .	18 47.12	0.03	23.38	7 18 23.71	1.19
	Weisse (2) 730 .	39	51.7	53.9	57.0	13.0	15.2	17.5	19.6	21.7	37.4	41.0	43.1	27 17.38	0.34	23.38	7 26 53.66	2.21
	*−23° 32′ . . .	40	6.9	8.8	11.4	24.5	26.0	27.9	29.6	31.4	44.3	47.0	48.9	31 27.88	0.04	23.38	7 31 4.46	1.27
	Lacaille 7876 . .	41	8.7	10.3	13.0	26.1	27.8	29.7	31.5	33.0	46.1	48.7	50.8	32 29.61	0.04	23.38	7 32 6.19	1.27
	*+38° 20′ . . .	42	32.3	34.0	37.3	52.4	54.4	56.6	58.7	0.6	15.7	19.0	20.9	41 56.54	0.32	23.37	7 41 32.85	2.23
	*+ 0° 26′ . . .	43	40.7	42.2	44.7	56.5	58.1	59.6	1.3	2.8	14.8	17.4	19.0	44 59.73	0.12	23.37	7 44 36.24	1.58
	*+44° 18′ . . .	44	37.8	39.7	43.3	59.9	2.1	4.5	6.7	8.6	25.4	28.8	31.4	50 4.38	0.37	23.37	7 49 40.64	2.49
	*+28° 57′ . . .	45	43.6	45.3	48.2	1.7	3.5	5.4	7.3	9.0	22.6	25.6	27.5	0 5.43	0.25	23.37	7 59 41.81	2.12
	ρ Argus	46	22.3	23.9	26.7	39.6	41.4	43.2	44.9	46.6	59.7	2.5	4.2	2 43.18	0.04	23.37	. . . .	1.41
	Lacaille 3249 . .	47	12.7	14.1	16.8	. .	32.3	34.0	35.7	. .	50.7	53.7	55.9	13 33.99	0.03	23.36	8 13 10.60	1.44
	Weisse (2) 382 .	48	13.4	15.8	18.1	20.1	23.5	. .	42.5	47.7	47.7	50.0	52.6	19 2.94	0.43	23.36	8 18 39.15	2.56
	B. A. C. 2830 . .	49	. .	. .	. .	11.4	23.2	36.4	49.5	1.0	. .	. .	. .	24 36.30	2.41	23.36	8 24 10.53	12.32
	π Ursæ Majoris . .	50	10.6	13.7	19.8	47.6	51.4	55.0	59.0	2.5	30.6	36.6	40.3	29 55.19	− 0.71	−23.36	8 29 31.12	− 4.33

March 19. Saw only one star.

CORRECTIONS, &c.

Date.		Error of clock.	Hourly rate.	n	c
1877.	h.	s.	s.	s.	s.
Mar. 15.	7.9	+ 1.15	− 0.055	− 0.06	− 0.12
20.	7.9	− 23.37	+ 0.025	− 0.20	− 0.12

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductio to 1877.0
			I.	II	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.															m. s.	s.	h. m. s.	s.
Mar. 20 Y.	ε Hydræ	1	21.9	23.5	26.0	38.0	39.7	41.2	42.8	44.3	56.5	58.8	0.5	40 41.20	− 0.14	−23.35	. . . .	− 1.9
	B. A. C. 3015 . .	2	21.7	23.2	25.9	38.5	40.0	41.8	43.5	45.0	57.6	0.2	1.9	46 41.75	0.14	23.35	8 46 18.26	2.1
	B. A. C. 3042 . .	3	13.2	23.5	38.9	58.1	8.1	19.0	30.4	40.0	59.7	16.2	26.8	53 19.45	2.11	23.35	8 52 53.99	11 5
	5 Ursæ Majoris. .	4	30.9	34.4	39.9	7.1	0.6	14.5	16.3	21.6	48.6	54.7	58.2	1 14.25	0.69	23.34	9 0 50.22	4.5
	B. A. C. 3182 (2d *)	5	6.5	8.6	12.6	31.2	33.3	35.9	38.6	40.9	59.2	3.1	5.5	14 35.95	− 0.43	23.34	9 14 12.18	3.3
23	δ Ursæ Minoris, S. P.	6	. .	. .	. .	18.0	4.0	12.0	40.0	6.0	. .	. .	. .	12 12.00	+ 1.85	20.32	. . . .	6.9
	49 Aurigæ . . .	7	27.5	29.2	32.0	1 5	7 3	49.2	51.0	52.7	6.2	9.1	11.0	27 49.16	− 0.14	20.32	6 27 28.70	1.4
	γ Geminorum . .	8	38	39.8	12.4	5 9	6 5	58.2	59.9	1.4	13.9	16.5	18.2	30 58.17	0.13	20.32	6 30 37.72	1.3
	42 Camelopardi . .	9	.	4 0	0.5	22 2	6 2	30.7	34.8	38 9	10.3	16.9	. .	38 30.54	0.32	20.32	6 38 9.86	2.7
	51 Cephei	0	.		.	46 5	9 5	55.0	28.0	59.5	. .	. .	. .	42 53.70	2.67	20.31	. . . .	15.8
	*−20° 26′ . . .		17	19.6	9	3 9	36 5	38.4	40.1	41.6	54.4	57.2	58.7	55 38.28	0.12	20.31	6 55 17.85	1.0
	*−20° 28′ . . .	2	24	2 7	1	.	42.8	44 6	46.5	. .	0.7	3.4	5.1	55 44.55	0.12	20.31	6 55 24.12	1.0
	δ Canis Majoris .	3	23	2 3	28 0	1	43.1	44.9	16.9	18.6	1.6	4.5	6.3	3 44.94	0.13	20.30	7 3 24.51	1.0
	B. A. C. 2377 . .		34	43 9	59 5	17.3	27.7	38.1	49.2	58.7	16.0	32.2	43.0	12 38.17	0.79	20.30	7 12 17.08	7.0
	Weisse (2) 730 .	15	48 6	50.6	9	9.8	11.9	14.3	16.5	18.5	34.5	37.2	39.2	27 14.09	0.17	20.30	7 26 53.62	2.1
	O. Arg. S. 7286 .	16	14 7	16.3	19.2	. .	. .	. .	. .	14.3	16.3	18.1	20.2	37 51.30	14.80	20.29	7 37 16.21	1.1
	O. Arg. S. 7296 .	17	27 6	29.3	31.9	45.9	47.5	49.5	51.4	53.2	6.9	9.6	11.6	37 49.49	0.13	20.29	7 37 29 07	1.1
	π Ursæ Majoris. .	18	6 9	10.4	16.0	13.8	47.7	51.6	55.5	59.0	27.0	32.7	36.7	29 51.57	0.28	20.28	8 29 31.01	4.2
	ε Hydræ	19	18 7	20.2	22.7	34.8	36.3	38.0	39.6	41.2	3.1	55.7	57.3	40 37.96	0.12	20.27	8 40 17.57	1.8
	B. A. C. 3015 . .	20	18 5	20.6	22.5	35.2	36.7	38.5	40.1	41.8	54.3	57.0	58.6	46 38.47	0.13	20.27	8 46 18 07	2.1
	B. A. C. 3042 . .	21	9	17 8	33.8	53.4	3.0	14.6	25.0	35.5	54.7	11.0	21.9	53 14.42	0.80	20.27	8 52 53.35	11.5
	κ Cancri	22	1	9.	12.1	24.2	25.8	27.5	29.2	30.8	42.8	45.4	47.1	1 27.50	0.12	20.27	9 1 7 11	2.0
	B. A. C. 3182 (1st *)	23		.	. .	27.1	29.2	31.8	34.5	36.9	. .	. .	. .	14 31.90	0.18	20.26	9 14 11.46	3.3
	Lacaille 3815 . .	24	20.9	22.7	25.9	11.2	43.4	45.5	47.6	49.6	4 9	7.8	9.7	19 45.38	0.15	20.26	9 19 24.97	1.6
	B. A. C. 3255 . .	25	0	8.8	11.6	25.2	27.0	28.9	30.7	32.5	46.0	48.9	50.8	26 28.85	0.14	20.26	9 26 8.45	2.5
	B. A. C. 3275 . .	26	5	29.2	31.9	43.0	50.4	59.0	7.5	15.5	16.1	29.4	37.2	31 59.15	0.62	20.26	9 31 38.27	9.69
	28 Ursæ Minoris .	27	0	11.5	17.1	44.4	48.2	51.9	55.7	59.3	26.5	32.2	36.1	36 51.90	0.28	20.25	9 36 31.37	4.84
	*+25° 7′ . . .	28	44.3	46.0	48.8	1.9	3.5	5.4	7.3	9.0	22.1	24.9	26.7	42 5.45	0.14	20.25	9 41 45.06	2.49
	*+25° 8′ . . .	29	8	14.	17.0	30.3	32.0	33.8	35 7	37.4	50.5	53.3	5 .2	43 33.85	0.14	20.25	9 43 13.46	2.50
	B. A. C. 3376 . .	30	41.3	46.6	55.2	37.3	42.5	48.6	54.2	59.5	41.4	50.2	56.0	47 48.44	0.43	20.25	9 47 27.76	7.13
	*+13° 28′ . . .	31	38.5	40	12.2	54.9	56.3	58.0	59.8	1.4	13.7	16.1	17.8	56 58.06	0.13	20.25	9 56 37.68	2.29
	Weisse (2) 1259 .	32	15.4	17	20	35.9	37.9	40.1	42.2	44.2	59.5	2.8	4.9	0 40.07	0.15	20.24	10 0 19.68	3.01
	*+.2° 7′ . . .	33	11.1	12 7	,	29.8	31.7	33.6	35.5	37.3	51.4	54.4	56.4	6 33.60	0.15	20.24	10 6 13.21	2.77
	γ^1 Leonis	34	13.8	15 1	0	30.9	32.4	4.2	36.0	37.6	50.4	52.9	54.8	13 34.22	0.13	20.24	10 13 13.85	2.50
24	42 Camelopardi . .	35	39.2	43 0	19 9	21.1	25.4	29.6	34.0	38.1	9.2	16.0	20.5	38 29.64	0.32	19.40	6 38 19.92	2.69
	51 Cephei	36	. .	.		45.0	17.0	52.5	26.5	58.5	. .	. .	. .	42 51.90	2.20	19.40	. . . .	15.46
	ε Canis Majoris .	37	46.2	48	50 8	4.6	6.0	8.0	9.8	11.4	25.2	28.2	30.1	54 8 03	0.14	19.40	6 53 48.49	0.06
	δ Canis Majoris .	38	22.9	24.5	27.3	40.5	42.2	44.1	45.9	47.6	0.8	3.7	5.4	3 44.08	0.13	19.40	7 3 24.55	1.03
	B. A. C. 2377 . .	39	33.7	40.0	58.7	15.9	26.5	37 4	17.8	58.0	14.8	[illegible]	41 9	12 36 82	0.78	19.41	7 12 16.63	6.94
	Lalande 14473 .	40	39.5	41.4	44.7	0.4	2.7	4.9	7.1	9.0	24.8	28.2	30.4	22 4.83	0.16	19.41	7 21 45.26	2.07
	Weisse (2) 730. .	41	47.5	49.7	52.8	8.8	11.0	13.2	15.5	17.4	33.4	36.8	39.0	27 13.19	0.16	19.41	7 26 53.62	2.13
	*−23° 27′ . . .	42	. .	. .	. .	10.3	11.6	13.1	15.0	16.5	. .	. .	. .	43 13.30	0.12	19 41	7 42 53.77	1.25
	B. A. C. 2596 . .	43	. .	. .	. .	39.5	45.0	51.3	57.0	2.7	. .	. .	. .	15 51.10	0.40	19.41	7 45 31.29	5.17
	*+44 18′ . . .	44	33.5	35.5	39.0	55.7	57.9	0.2	2.4	4.4	21.2	24.6	27.0	50 0.13	0.17	19.41	7 49 40.55	2.40
	*+14° 43′ . . .	45	14.3	15.8	18.5	30.8	32.4	34.0	35.8	37.4	49.7	52.4	53.8	0 34.08	0.12	19.41	8 0 14.55	1.80
	B. A. C. 2732 . .	46	49.5	52.1	56.8	18.3	21.2	24 3	27.4	30.1	51.9	56.3	59.2	4 24.28	0.22	19.41	8 4 4.65	3.16
	*−30° 11′ . . .	47	25.5	27.8	29 9	32.2	34.3	. .	44.0	46.9	19 2	51.1	53 3	11 9.42	− 0.22	19.42	8 10 49.78	1.31
	*−30° 13′ . . .	48	50.2	51.7	54.3	. .	. .	. .	. .	. .	. .	. .	. .	10 52.07	+ 19.33	19.42	8 10 52.48	1.31
	*−30° 13′ . . .	49	. .	. .	. .	. .	. .	. .	. .	. .	30.2	33.0	35.0	11 32.73	− 20.13	19.42	8 10 53.18	1.31
	*−30° 34′ . . .	50	6.8	8.7	11.4	25.4	27.0	29.0	31.0	32.8	46.6	49.5	51.5	15 29.06	− 0.14	−19.42	8 15 9.50	− 1.31

CORRECTIONS, &c.

Date.		Error of clock.	Hourly rate.	*n*	*c*
1877.	h.	s.	s.	s.	s.
Mar. 27,	8.3	− 20.28	+ 0.021	− 0.01	− 0.12

5. Faint; cloudy.

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
77.														m. s.	s.	s.	h. m. s.	s.
r. 24	Weisse (2) 381.	1	33.2	35.1	38.4	54.0	55.9	58.2	0.2	2.3	18.0	21.4	23.5	18 55.20	− 0.26	−19.42	8 18 38.91	− 2.49
f.	Weisse (2) 382.	2	9.1	11.4	13.7	15.7	19.3	. .	38.1	41.3	43.4	45.7	48.2	18 58.59	0.66	19.42	8 18 38.62	2.49
	Weisse (2) 408.	3	. .	18.0	21.5	23.4	. .	. .	38.0	41.3	43.4	45.5	48.0	20 34.89	36.71	19.42	8 19 38.76	2.50
	B. A. C. 2830	4	. .	. .	. .	4.9	17.0	29.7	42.7	55.0	. .	. .	. .	24 29.86	1.47	19.42	8 24 8.97	11.80
	π Ursæ Majoris	5	5.8	9.3	15.0	42.9	46.7	50.5	54.4	57.8	25.8	31.8	35.7	29 50.52	0.12	19.42	8 29 30.68	4.20
	Weisse 885	6	40.5	42.1	44.6	57.0	58.5	0.3	2.0	3.6	15.9	18.4	20.1	35 0.27	0.12	19.42	8 34 40.73	1.59
	Weisse 936	7	5.8	7.4	10.0	22.3	23.9	25.7	27.3	28.8	41.2	43.7	45.4	37 25.59	− 0.12	19.42	8 37 6.05	1.98
	Lacaille 3574	8	23.2	24.8	26.0	42.0	43.9	45.9	47.7	49.7	. .	. .	. .	47 38.15	+ 7.50	19.42	8 47 26.23	1.48
	*−32° 6′	9	. .	26.9	30.0	31.9	44.5	47.6	49.5	51.6	53.8	. .	. .	48 41.98	− 33.02	19.42	8 47 49.54	1.48
	Weisse (2) 1329	10	36.5	38.5	41.5	56.7	58.7	0.9	2.9	4.9	20.1	23.3	25.4	56 0.85	− 0.15	19.42	8 55 41.28	2.66
	κ Cancri	11	7.2	8.7	11.3	23.5	24.9	26.7	28.4	29.9	. .	. .	. .	1 20.08	+ 6.48	19.42	9 1 7.14	2.04
	Weisse 153	12	14.2	15.6	18.0	30.0	31.6	33.4	34.9	36.3	48.3	50.9	52.5	9 33.25	− 0.12	19.43	9 9 13.70	1.98
	Weisse (2) 271.	13	29.6	31.2	33.8	46.2	47.8	49.5	51.2	52.9	5.2	7.8	9.5	14 49.52	0.12	19.43	9 14 29.97	2.18
	O. Arg. S. 9855	14	. .	. .	. .	59.8	1.3	3.2	5.2	7.1	. .	. .	. .	29 3.32	0.13	19.43	9 28 43.76	1.68
	O. Arg. S. 9856	15	21.2	23.5	25.5	27.5	30.5	. .	41.0	43.8	45.6	47.6	49.8	29 5.60	0.22	19.43	9 28 45.95	1.67
	B. A. C. 3284	16	. .	. .	. .	48.7	57.7	7.1	15.9	24.9	. .	. .	. .	33 6.86	0.67	19.43	9 32 46.76	10.48
	ε Leonis	17	53.0	54.8	57.3	10.5	12.1	14.0	15.8	17.6	30.5	33.3	35.2	39 14.01	0.13	19.43	9 38 54.45	2.46
	*+25° 7′	18	43.4	45.0	47.8	1.0	2.7	4.6	6.4	8.2	21.3	24.2	25.8	42 4.56	0.13	19.43	9 41 45.00	2.49
	*+25° 5′	19	11.9	13.5	16.3	29.4	31.1	33.0	34.8	36.6	49.7	52.4	54.3	43 33.00	0.13	19.43	9 43 13.44	2.49
	B. A. C. 3376	20	40.9	45.5	54.2	36.2	41.6	47.8	53.4	58.4	40.7	49.3	55.0	47 47.54	0.42	19.43	9 47 27.69	7.09
	*+13° 28′	21	3.9	5.4	7.8	19.9	21.6	23.3	25.2	26.8	38.7	41.2	43.1	57 23.35	0.12	19.43	9 57 3.80	2.29
	Weisse (2) 1259	22	14.6	16.6	19.6	35.1	37.1	39.3	41.5	43.4	58.7	2.0	4.1	0 39.27	0.16	19.44	10 0 19.67	3.01
	Weisse 35	23	47.0	48.5	50.8	. .	4.6	6.2	7.8	. .	21.3	23.8	25.5	5 6.17	0.12	19.44	10 4 46.61	2.02
	γ¹ Leonis	24	. .	. .	. .	30.0	31.6	33.5	35.2	36.8	49.4	52.3	53.8	13 40.32	7.04	19.44	10 13 13.84	2.49
30	ε Canis Majoris.	25	42.0	43.6	46.4	0.1	1.9	3.8	5.6	7.4	21.0	23.9	25.6	54 3.75	0.26	15.09	6 53 48.40	0.83
	δ Canis Majoris.	26	18.4	20.0	22.8	36.2	37.8	39.7	41.6	43.3	56.5	59.4	1.2	3 39.72	− 0.25	15.09	7 3 24.38	0.91
	B. A. C. 2377	27	27.8	37.2	52.5	11.0	20.7	31.2	42.4	51.8	9.6	25.9	36.1	12 31.47	+ 0.70	15.09	7 12 17.08	6.18
	Weisse (2) 874.	28	56.0	57.6	0.2	13.1	14.8	16.6	18.4	20.0	32.7	35.5	37.1	31 16.55	− 0.04	15.09	7 31 1.42	1.89
	O. Arg. S. 7296	29	22.5	24.0	26.8	40.7	42.3	44.3	46.2	48.0	1.6	4.7	6.6	37 44.34	− 0.27	15.10	7 37 28.97	1.03
	B. A. C. 2596	30	36.0	41.4	50.4	34.2	39.7	46.1	52.2	57.2	41.4	50.4	56.5	45 45.96	+ 0.37	15.10	7 45 31.23	− 4.78
	λ Ursæ Minoris, S. P	31	. .	. .	. .	. .	. .	. .	. .	32.0	. .	. .	. .	49 32.00	−2 55.23	15.10	. . . .	+ 54.31
	*+60° 45′	32	44.9	47.8	53.0	17.3	20.4	23.7	27.0	30.2	54.3	59.2	2.6	54 23.67	+ 0.17	15.10	7 54 8.74	− 3.13
	*+20° 55′	33	57.0	58.5	1.4	14.1	15.8	17.5	19.4	20.9	33.7	36.4	38.2	1 17.54	− 0.04	15.10	8 1 2.40	1.81
	*−30° 34′	34	7.9	9.7	12.2	. .	. .	. .	. .	. .	47.4	50.5	52.4	15 30.02	− 0.28	15.11	8 15 14.63	1.22
	Weisse (2) 381.	35	. .	. .	. .	49.7	51.3	53.4	55.8	57.8	. .	. .	. .	18 53.60	+ 0.03	15.11	8 18 38.54	2.38
	Weisse (2) 382.	36	29.1	31.0	34.3	. .	. .	. .	. .	. .	14.0	17.2	19.4	18 54.17	0.03	15.11	8 18 39.09	2.38
	*+40° 19′	37	. .	. .	. .	49.8	51.6	53.9	56.0	57.9	13.5	17.0	19.1	20 2.35	0.05	15.11	8 19 47.29	2.39
	B. A. C. 2830	38	. .	. .	. .	59.5	12.3	25.4	36.9	49.9	. .	. .	. .	24 24.80	+ 0.93	15.11	8 24 10.62	10.98
	*+24° 30′	39	. .	20.0	22.9	24.6	. .	. .	36.8	39.5	41.2	43.0	45.2	29 34.15	− 30.64	15.11	8 28 48.40	2.20
	*+19° 40′	40	27.6	29.1	31.6	44.0	46.0	47.9	49.6	51.3	3.8	6.5	8.3	33 47.79	0.04	15.11	8 33 32.64	2.12
	*+19° 41′	41	33.4	35.4	37.9	. .	. .	. .	. .	. .	10.1	12.6	14.4	33 53.97	0.05	15.11	8 33 38.81	2.13
	ε Hydræ	42	. .	. .	. .	29.6	31.2	32.7	34.4	36.0	47.8	50.6	52.1	40 39.30	− 6.62	15.12	8 40 17.56	1.80
	τ Ursæ Minoris.	43	21.5	24.9	30.7	57.9	1.3	5.2	9.0	12.6	39.9	45.3	49.0	1 5.21	+ 0.20	15.12	9 0 50.29	4.57
	Weisse 153	44	9.7	11.2	13.7	25.6	27.3	28.9	30.5	32.2	. .	. .	. .	9 22.39	+ 6.41	15.13	9 9 13.67	2.04
	Weisse (2) 271.	45	25.3	26.6	29.4	41.8	43.5	45.4	46.9	48.4	0.7	3.3	5.1	14 45.13	− 0.06	15.13	9 14 29.94	2.24
	α Hydræ	46	30.4	31.9	34.3	46.2	47.9	49.6	51.2	52.8	4.8	7.4	9.0	21 49.59	− 0.15	15.13	9 21 34.31	1.79
	B. A. C. 3275	47	. .	. .	. .	36.9	45.6	54.0	1.4	9.3	. .	. .	. .	31 53.44	+ 0.59	15.14	9 31 38.89	9.78
	ε Leonis	48	48.8	50.3	53.0	6.3	7.9	9.8	11.5	13.0	26.2	29.0	30.7	39 9.68	− 0.03	15.14	9 38 54.51	2.39
r. 5	ρ Argus	49	11.8	13.4	16.3	29.3	30.8	32.6	34.6	36.4	49.3	52.2	53.8	2 32.77	+ 0.12	13.29	8 2 19.60	1.12
	B. A. C. 2749	50	. .	. .	. .	12.2	17.0	23.0	28.4	33.5	. .	. .	. .	7 22.82	+ 0.11	−13.29	8 7 9.64	− 4.16

March 31. Image west $0^r.45$; clamp east.
Image west $0^r.21$; clamp west.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Mar. 24, 8.6	− 19.42	− 0.011	0.00	− 0.12
30, 8.3	− 15.11	− 0.022	+ 0.23	− 0.12

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductio to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	s.	s.	h. m. s.	s.
Apr. 5 Y.	*−30° 34′ . . .	1	4.7	6.3	8.5	. .	. .	. .	. .	. .	44.9	47.0	48.6	15 26.66	+ 0.14	−13.28	8 15 13.52	− 1.1
	*+40° 21′ . . .	2	26.4	28.4	31.4	47.0	49.0	51.0	53.0	55.8	10.6	13.3	15.1	18 51.00	0.08	13.28	8 18 37.80	2.2
	Weisse (2) 382. .	3	2.2	4.6	7.1	9.0	12.2	. .	31.2	34.7	36.7	38.7	41.3	18 51.77	0.18	13.28	8 18 38.67	2.2
	Weisse (2) 438. .	4	25.1	27.5	30.7	46.6	48.5	50.6	52.7	54.9	10.4	13.5	15.4	20 50.54	0.08	13.28	8 20 37.34	2.2
	Weisse (2) 579. .	5	16.5	18.1	21.3	35.2	36.9	39.0	40.8	42.6	56.6	59.5	1.1	26 38.87	0.08	13.27	8 26 25.68	2.0
	*+24° 30′ . . .	6	21.9	24.0	27.0	40.1	41.7	43.5	46.1	47.9	0.1	3.2	5.2	30 43.70	+ 0.08	13.27	8 30 30.51	1.9
	Weisse (2) 856. .	7	. .	. .	. .	1 2	4.8	6.7	21.4	25.4	27.3	29.4	32.3	36 18.56	− 37.94	13.26	8 35 27.36	2.4
	O. Arg. S. 8946 .	8	0.7	2.8	5.2	18.7	20 4	22.2	24.0	26.0	39.4	42.4	43.7	40 22.32	+ 0.13	13 26	8 40 9.19	1.2
	Lacaille 3552 . .	9	0.4	2.5	5.4	19.1	20.8	22.7	24.4	26.4	40.5	43.0	45.0	45 22.75	0.13	13.25	8 45 9.63	1.2
	Weisse (2) 1324 .	10	29.7	31.8	34.9	50.0	52.1	54.3	56.4	58.3	13.6	15.5	18.3	55 54.17	0.08	13.25	8 55 41.00	2.4
	κ Cancri	11	0.6	2.2	4.7	16.8	18.4	20.1	21.7	23.2	35 5	37.9	39.5	1 20.05	0.08	13.24	9 1 6.89	1.8
	*−23° 35′ . . .	12	23.3	24.9	27.1	41.8	43.3	44.7	46.4	48.0	. .	. .	. .	6 37.44	7.18	13.24	9 6 31.38	1.4
	*−34° 49′ . . .	13	58.6	0.7	3.8	18.3	20.2	22.1	24.1	26.2	40.7	43.6	45.4	16 22.15	0.15	13.23	9 16 9.07	1.4
	α Hydræ	14	28.0	29.7	32.2	44.1	45.8	47.4	49.0	50.7	2.9	5.3	6.6	21 47.43	0.10	13.22	9 21 34.31	1.7
	O. Arg. S. 9789 .	15	42.9	44.8	47.7	1.2	3.0	4.8	6.7	8.6	22.3	24.9	26.9	25 4.89	0.13	13..2	9 24 51.80	1.5
	*−23° 52′ . . .	16	46.6	48.1	50.7	2.4	4.6	7.0	9.1	10.8	. .	. .	. .	31 59.91	+ 7.20	13.22	9 31 53.89	1.5
	*−23° 52′ . . .	17	. .	. .	. .	31.5	34.0	35.5	46.6	49.3	51.0	53.4	55.3	32 44.58	− 30.23	13.22	9 32 1.13	1.5
	*+18° 5′ . . .	18	. .	. .	. .	4.3	6.0	7.8	9.4	11.1	23.7	26.3	27.8	45 14.55	− 6.74	13.20	9 44 54.61	2.2
	Lacaille 4120 . .	19	50.6	52.6	55.7	9.8	11.4	13.6	15.4	17.2	31.3	34 4	36.0	58 13.45	+ 0.14	13.19	9 58 0.40	1.6
	32 Ursæ Majoris. .	20	35.9	40.0	46.0	15.2	19.0	22.8	26.7	30.5	59.6	5.8	9.2	9 22.79	0.11	13.18	10 9 9.72	4.9
	γ¹ Leonis	21	6 5	8.2	10.6	23.4	25.1	26.8	28.6	30.2	43.0	45.7	47.3	13 26.86	0.08	13.18	10 13 13.76	2.4
	24 Sextantis . . .	22	6.4	8.1	10.6	22.4	24.0	25.6	27.2	28.8	40.9	43.3	44.8	17 25.65	0.09	13.17	10 17 12.57	2.0
	*+64° 55′ . . .	23	10.3	15.0	20.7	48.8	52.5	56.4	0.4	4.0	32.5	38.0	41.5	22 56.37	0.11	13.17	10 22 43.31	4.9
	Lalande 20482. .	24	26.0	27.7	30.4	42.3	43.8	45.5	47.0	48.7	0.9	3.4	5.0	28 45.52	0.10	13.16	10 28 32.46	2.1
	B. A. C. 3629 . .	25	. .	. .	. .	20.2	28.7	39.4	50.0	59.8	. .	. .	. .	31 39.62	0.20	13.16	10 31 26.66	12.0
	B. A. C. 3652 . .	26	. .	. .	. .	23.6	28.1	32.9	37.6	42.2	. .	. .	. .	34 32.88	0.09	13.16	10 34 19.81	6.2
	O. Arg. N. 11176 .	27	25.3	29.[illegible]	34.2	0.0	3.9	7.4	10.8	14.4	40.4	45.7	49.2	45 7.30	0.10	13.15	10 44 54.25	4.7
	B. A. C. 3747 . .	28	49.8	58.5	10.9	11.1	17.7	25.5	34.6	42.1	41.9	54.0	0.9	50 26.09	0.20	13.15	10 50 13.14	9.8
	*−32° 53′ . . .	29	12.9	14 8	17.7	32.2	33.6	35.4	37.3	39.1	. .	. .	. .	1 27.88	7.85	13.14	11 1 22.59	1.9
	δ Leonis	30	29.0	30.7	33.3	46.1	47.7	49.4	51.3	52.9	5.8	8.4	10.0	7 49.51	0.08	13.13	11 7 36.46	2.5
	δ Crateris . . .	31	6.9	8.7	11.2	23.4	25.0	26.7	28.5	30.0	42.4	44.9	46.4	13 26.74	0.11	13.13	11 13 13.72	2.1
	λ Draconis . . .	32	28.2	32.9	40.4	15.3	19.5	24.4	[illegible]8.8	33.9	8.8	16.0	20.4	24 24.42	+ 0.12	13.12	11 24 11.42	− 6.2
6	λ Ursæ Minoris, S. P.	33	. .	. .	. .	52.0	15.0	46.0	12.0	35.0	. .	. .	. .	46 44.00	− 2.48	12.58	. . . .	+ 46.8
	ρ Argus	34	11.1	12.8	15.6	28.6	30.3	32.0	33.9	35.6	48.7	51.4	52.9	2 32.08	+ 0.12	12.59	8 2 19.61	− 1.10
	B. A. C. 2749 . .	35	16.7	22.2	30.9	11.1	16.1	21.5	27.0	32.7	12.8	21.2	26.0	7 21.65	0.14	12.59	8 7 9.20	4.50
	*−29° 46′ . . .	36	. .	. .	. .	57.9	59.9	2.1	4.3	5.9	. .	. .	. .	15 2.02	0.12	12.60	8 14 49.54	1.10
	*+17° 31′ . . .	37	. .	. .	. .	56.4	58.0	59.7	1.4	3.0	. .	. .	. .	18 59.70	0.07	12.60	8 18 47.17	1.75
	Weisse (2) 579. .	38	15.7	17.6	20.4	. .	. .	. .	. .	. .	55.8	58.6	0.6	26 38.12	0.09	12.61	8 26 25.60	2.06
	*+27° 34′ . . .	39	12.8	14.4	16.5	30.6	32.2	34.0	35.7	37.6	51.2	53.5	55.2	29 33.97	0.08	12.61	8 29 21.44	2.00
	*+20° 8′ . . .	40	11.0	12.6	15.2	28.0	29.7	31.4	33.0	34.9	. .	. .	. .	33 24.48	6.97	12.62	8 33 18.83	1.88
	B. A. C. 2919 . .	41	52.4	54.5	56.3	58.0	0.5	. .	4.6	7.4	9.0	10.9	12.8	33 32.64	+ 0.16	12.62	8 33 20.18	1.88
	42 Cancri	42	. .	. .	. .	. .	. .	. .	25.7	28.5	30.2	32.0	34.0	34 30.08	− 36.19	12.62	8 33 41 27	1.88
	*+14° 7′ . . .	43	. .	. .	. .	34.0	35.6	37.3	38.9	40.7	53.0	55.6	57.2	36 44 04	− 6.60	12.62	8 36 24.82	1.80
	B. A. C. 3042 . .	44	56.7	7.4	23.9	43.3	52.4	4.0	14.9	25.8	44.4	0.4	10.0	53 3.93	+ 0.26	12.63	8 52 51.56	8.97
	τ Ursæ Majoris. .	45	18.3	21.9	27.8	55.0	58.3	1.9	5.7	9.2	36.6	42.3	45.8	1 2.08	0.11	12.64	9 0 49.55	4.0
	α Hydræ	46	27.6	29.2	31.6	43.8	45.3	46.9	48.6	50.2	2.2	4.7	6.2	21 46.94	0.10	12.66	9 21 34.38	1.7
	ε Leonis	47	45.9	47.6	50.4	3.5	5.0	6.9	9.7	10.4	23.5	26.2	27.8	39 6.99	0.08	12.68	9 38 54.39	2.3
	μ Leonis	48	39.[illegible]	41.2	44.0	57.2	59.0	0 9	2.7	4.4	17.8	20.4	22.1	46 0.81	0.08	12.68	9 45 48.21	2.3
7	*−24° 40′ . . .	49	1.9	3.5	6.3	19.8	21.3	23.1	24.6	26.5	39.8	42.3	43.9	30 23.00	0.12	12.55	8 30 10.57	1.2
	b Mali	50	7.4	9.4	12.5	27.0	28.9	31.0	32.9	34.8	49.5	52.5	54.3	35 30.93	+ 0.15	−12.56	8 35 18.52	− 1.1

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
April 5, 9.8	− 13.20	+ 0.052	− 0.05	+ 0.09
6, 9.2	− 12.65	− 0.051	− 0.05	+ 0.09
7, 9.3	− 12.57	− 0.020	− 0.05	+ 0.09

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
877.														m. s.	s.	s.	h. m. s.	s.
pr. 7	ε Hydræ	1	10.5	12.1	14.8	26.6	28.3	29.8	31.5	33.0	45.1	47.6	49.0	40 29.85	+ 0.09	− 12.56	. . . .	− 1.69
Y.	O. Arg. S. 9040 .	2	29.[illegible]	30.7	33.5	. .	. .	. .	. .	. .	6.3	9.3	11.0	44 49.98	0.12	12.56	8 44 37.54	1.31
	B. A. C. 3042 . .	3	55.8	6.6	23.5	42.4	52.2	3.8	14.8	24.9	43.9	0.0	10.3	53 3.47	0.26	12.56	8 52 51.17	9.56
	κ Cancri	4	59.9		4.1	16.3	17.8	19.3	21.1	22.7	34.8	37.5	39.0	1 19.45	0.08	12.56	. . . .	1.87
	B. A. C. 3284 . .	5	10.4	[illegible]9.4	33.4	40.5	48.7	57.8	7.7	15.8	23.0	36.9	44.5	32 58.01	0.22	12.57	9 32 45.66	9.33
	B. A. C. 3376 . .	6	32.0	38.0	46.6	28.6	33.7	39.2	45.3	50.3	32.9	41.5	46.7	47 39.53	0.15	12.58	9 47 27.10	6.44
	α Leonis	7	44.2	46.0	48.4	0.5	2.2	3.9	5.6	7.3	19.5	21.8	23.6	2 3.91	0.08	12.58	. . . .	2.16
	Lalande 19869. .	8	58.6	0.8	3.7	17.7	19.5	21.5	23.5	25.2	39.3	42.3	43.8	7 21.45	0.08	12.59	10 7 8.94	2.65
11	ρ Argus	9	11.6	13.3	16.1	29.0	30.6	32.5	34.5	36.1	49.0	51.8	53.4	2 32.54	+ 0.15	13.19	8 2 19.50	1.01
	Lalande 16413. .	10		. .	. .	45.9	48.9	50.8	4.2	7.4	9.3	11.3	13.5	18 1.41	− 34.01	13.19	8 17 14.21	2.01
	*−24° 40′ . . .		2.6	4.2	7.1	20.2	21.8	23.6	25.5	27.2	40.4	43.0	44.7	30 23.66	+ 0.15	13.19	8 30 10.62	1.16
	*−33° 35′ . . .	2	42.5	44.5	48.2	. .	. .	. .	. .	. .	24.3	27.0	28.8	34 5.88	0.19	13.19	8 33 52.88	1.05
	Lacaille 3459 . .	3	48	50.1	53.2	. .	. .	. .	. .	. .	30.0	32.5	34.5	35 11.40	0.19	13.19	8 34 58.40	1.06
	*−33° 35′ . . .	4	1	3.1	6.2	20.3	22.2	24.2	26.2	28.0	42.3	45.3	47.0	35 24.17	0.18	13.19	8 35 11.16	1.06
	Weisse (2) 1024 .		10.9	12.7	15.4	29.0	30.6	32.5	34.4	36.2	49.5	52.3	54.2	42 32.52	0.05	13.19	8 42 19.38	1.99
	Weisse (2) 1051 .	16	19.6	21.4	24.2	37.6	39.5	41.3	43.2	44.9	58.3	1.1	2.8	43 41.26	0.05	13.19	8 43 28.12	2.01
	*−32° 57′ . . .	17	56.5	58.5	1.6	15.7	17.5	19.4	21.4	23.4	. .	. .	. .	50 11.75	+ 7.88	13.19	8 50 6.44	1.16
	Lacaille 3995 . .	18	. .	. .	. .	36.1	38.0	40.0	41.9	43.7	58.2	1.0	2.8	50 47.71	− 7.55	13.20	8 50 26.96	1.16
	*−34° 49′ . . .	19	. .	. .	. .	39.7	42.5	44.4	57.2	0.4	2.5	4.7	6.8	55 54.78	− 33.63	13.20	8 55 7.95	1.16
	κ Cancri	20	0.4	2.0	4.7	16.8	18.3	19.9	20.6	23.2	35.4	38.0	39.4	1 19.88	+ 0.07	13.20	9 1 6.75	1.81
	O. Arg. S. 9450 .	21	. .	. .	. .	. .	. .	. .	. .	. .	2.5	5.0	6.8	7 4.77	− 18.69	13.20	9 6 32.88	1.37
	*−28° 43′ . . .	22	. .	. .	. .	4.8	6.5	8.2	10.0	11.8	. .	. .	. .	15 8.26	+ 0.15	13.20	9 14 55.21	1.36
	Lacaille 3815 . .	23	12.9	15.3	18.5	33.7	35.7	37.6	39.9	41.7	57.3	0.3	2.4	19 37.75	0.19	13.20	9 19 24.74	1.26
	Lacaille 3874 . .	24	23.3	25.3	28.3	42.5	44.3	46.0	48.2	50.0	4.3	7.1	8.9	24 46.20	+ 0.17	13.20	9 24 33.17	1.37
	B. A. C. 3284 . .	25	10.8	19.7	34.1	40.5	48.8	58.1	7.7	15.9	22.9	36.4	44.8	32 58.15	− 0.05	13.20	9 32 44.90	8.96
	*−40° 36′ . . .	26	0.0	1.7	5.0	20.8	22.7	24.7	26.9	29.0	44.9	48.2	50.2	40 24.92	+ 0.21	13.20	9 40 11.93	1.38
	*+18° 5′ . . .	27	. .	. .	. .	4.3	5.9	7.7	9.4	11.0	23.6	26.3	27.8	45 14.50	− 6.76	13.20	9 44 54.54	2.15
	*−34° 43′ . . .	28	18.6	20.4	22.8	38.0	39.6	41.8	4[illegible].0	45.9	0.2	3.2	5.3	54 41.80	+ 0.18	13.20	9 54 28.78	1.52
	Lacaille 4120 . .	29	50.7	52.7	55.7	9.8	11.6	13.5	15.6	17.3	31.6	34.6	36.2	58 13.57	0.17	13.20	9 58 0.54	1.56
	α Leonis	30	44.9	46.5	49.2	1.3	2.8	4.5	6.2	7.8	20.0	22.5	24.0	2 4.52	0.07	13.20	10 1 51.39	2.12
	*−3° 28′ . . .	3	55.6	57.2	59.7	11.4	13.1	14.8	16.7	18.4	29.5	32.5	34.0	13 14.81	+ 0.10	13.20	10 13 1.71	1.94
	*+64° 55′ . . .	32	11.0	14.4	20.8	48.8	52.4	56.2	0.1	3.8	31.9	37.8	41.3	22 56.23	0.00	13.20	10 22 43.03	4.78
	B. A. C. 3593 . .	33	. .	. .	. .	42.6	49.0	55.8	3.0	9.4	. .	. .	. .	24 55.96	− 0.07	13.20	10 24 42.69	7.88
	Lalande 20482. .	34	26.0	27.6	30.2	42.3	43.8	45.5	47.3	48.8	0.8	2.5	4.9	28 45.43	+ 0.11	13.20	10 28 32.34	1.92
	O. Arg. N. 11176 .	3	25.9	29.0	34.9	1.5	4.7	7.9	11.5	15.1	41.6	46.6	50.0	45 8.06	0.60	13.20	10 44 54.86	4.64
	*−31° 8′ . . .	36	14.9	16.6	19.3	33.3	35.0	36.9	38.8	40.9	54.4	57.5	59.2	49 36.98	0.17	13.20	10 49 23.95	1.85
	*+12° 33′ . . .	37	54.[illegible]	55.9	58.4	10.8	12.4	14.2	15.7	17.2	. .	. .	. .	53 7.36	6.70	13.20	10 53 0.86	2.33
	Weisse 1076 . .	38	54.2	55.7	58.6	10.4	11.9	13.5	15.2	16.9	29.1	31.6	33.1	1 13.65	+ 0.07	13.20	11 1 0.52	2.32
	O. Arg. S. 11213 .	39	12.0	14.7	16.9	18.7	20.5	. .	51.0	53.8	55.6	57.4	59.6	4 36.07	− 19.30	13.20	11 4 3.57	1.94
	O. Arg. S. 11214 .	40	55.7	57.3	0.1	. .	. .	. .	. .	. .	34.7	37.6	39.4	4 17.47	+ 0.17	13.20	11 4 4.44	1.94
	Weisse 133 . .	4	51.4	53.0	55.5	6	9.0	10.5	12.3	13.8	25.9	28.4	29.8	10 10.65	0.10	13.20	11 9 57.55	2.17
	B. A. C. 3864 . .	42	4.6	8.2	14.6	4[illegible]3	46.3	50.0	54.0	57.7	25.7	31.7	35.3	15 50.04	0.00	13.20	11 15 36.84	5.10
	B. A. C. 3901 . .	43	32.9	34.4	36.9	48.8	50.3	52.0	53.6	55.0	7.0	9.5	11.0	21 51.95	+ 0.09	13.20	11 21 38.84	2.23
	*+36° 57′ . . .	44	. .	. .	. .	48.7	50.8	52.8	55.0	56.8	11.8	14.9	16.8	25 0.95	− 8.07	13.20	11 24 39.68	3.02
	Lalande 21902. .	45	30.3	32.3	35.5	50.5	52.1	54.4	56.4	58.3	13.2	16.4	18.1	25 54.32	+ 0.04	13.20	11 25 41.16	3.02
	ν Leonis	46	35.3	37.0	39.5	51.4	52.9	54.4	56.1	57.7	9.7	12.1	13.6	30 54.52	0.09	13.20	11 30 41.41	2.26
	Rumker 3697 . .	47	36.8	38.6	41.2	54.0	55.7	57.6	59.3	1.0	14.0	16.7	18.2	35 57.55	0.14	13.20	11 35 44.49	2.65
	O. Arg. S. 11656 .	48	1.7	3.6	6.4	19.5	21.4	23.1	24.9	26.4	. .	. .	. .	41 15.88	+ 7.31	13.20	11 41 9.99	2.11
	*−25° 18′ . . .	49	. .	. .	. .	41.7	43.4	45.1	47.0	48.6	1.8	4.5	6.3	41 52.30	− 7.02	13.20	11 41 32.08	2.12
	B. A. C. 4009 . .	50	21.5	23.4	26.3	40.2	41.8	43.8	45.7	47.4	1.2	4.3	5.9	45 43.77	+ 0.16	− 13.20	11 45 30.73	− 2.12

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Apr. 11, 10.6	− 13.20	− 0.003	− 0.10	+ 0.09

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductio to 1877.
1877.														m. s.	s.	s.	h. m. s.	s.
Apr. 11 Y.	o Virginis . . .	1	52.7	54.4	56.8	9.0	10.6	12.2	13.7	15.3	27.5	30.1	31.6	59 12.17	+ 0.07	−13.20	11 58 59.04	− 2.4
	*−27° 17′ . . .	2	4.3	6.1	8.9	22.1	24.0	26.0	27.8	29.4	42.8	45.7	47.3	2 25.85	0.15	13.20	12 2 12.80	2.1
	Weisse 114 . .	3	11.4	12.9	15.5	27.5	29.2	30.7	32.4	33.9	46.2	48.7	50.2	10 30.78	0.11	13.20	12 10 17.69	2.2
	Weisse 221 . .	4	9.4	11.1	13.9	25.8	27.4	29.0	30.7	32.2	44.1	46.7	48.3	15 28.96	0.08	13.20	12 15 15.84	2.4
	*−37° 19′ . . .	5	49.2	51.4	53.7	55.7	58.6	. .	14.3	17.6	19.4	21.5	23.9	22 36.53	0.28	13.21	12 22 23.60	2.3
	*−37° 16′ . . .	6	. .	. .	. .	35.3	37.4	39.2	40.8	42.9	. .	. .	. .	22 39.12	0.18	13.21	12 22 26.09	2.2
	O. Arg. S. 12246 .	7	32.1	33.8	36.4	49.6	51.0	53.0	54.8	56.6	9.2	11.9	13.6	27 52.91	0.14	13.21	12 27 39.84	2.2
	Weisse 498 . .	8	9.6	11.1	13.8	25.6	27.0	28.7	30.2	31.9	44.0	46.4	47.9	31 28.75	0.10	13.21	12 31 15.64	2.3
	γ¹ Virginis . . .	9	3.3	5.1	6.9	8.5	11.0	. .	11.1	13.8	15.3	16.9	19.8	35 41.17	0.16	13.21	12 35 28.12	2.4
	γ² Virginis . . .	10	21.8	23.5	26.2	38.1	39.6	41.3	42.9	44.5	56.2	58.8	0.3	35 41.20	0.09	13.21	12 35 28.08	2.4
	11 Canum Venat. .	11	49.4	51.9	55.9	13.8	16.3	18.9	21.5	23.8	41.8	45.7	48.0	43 18.82	0.02	13.21	12 43 5.63	3.6
	B. A. C. 4331 . .	12	56.9	59.1	2.4	18.9	21.0	23.1	25.5	26.8	44.0	47.8	49.7	48 23.20	0 27	13.21	12 48 10.21	2.4
	*+69° 22′ . . .	13	0.7	5.4	12.8	. .	. .	. .	. .	. .	38.6	45.4	49.5	53 55.40	0.04	13.21	12 53 42.23	5.9
	Groombridge 1947	14	47.9	52.5	59.8	. .	. .	. .	. .	. .	25.8	32.9	37.0	54 42.65	0.04	13.21	12 54 29.48	5.9
	θ Virginis . . .	15	31.3	32.8	35.4	47.4	48.8	50.6	52.2	53.7	5.6	8.2	9.7	3 50.52	0.10	13.21	13 3 37.41	− 2.4
	Polaris, S. P. . .	16	. .	. .	. .	27.0	35.0	45.0	56.0	0.0	. .	. .	. .	12 44.60	1.03	13.21	. . . .	+ 69.8
12	ε Hydræ	17	11.3	13.0	15.5	27.6	29.0	30.7	32.4	34.1	46.1	48.5	50.0	40 30.75	0.10	13.49	8 40 17.36	-- 1.6
	Weisse 1274 . .	18	21.5	23.2	25.6	37.7	39.4	40.9	42.6	44.0	56.1	58.7	0.0	50 40.88	0.08	13.50	8 50 27.46	1.4
	*−34° 49′ . . .	19	11.9	14.1	17.5	. .	. .	. .	. .	. .	51.7	53.4	55.6	54 34.03	0.03	13.50	8 54 20.56	1.1
	κ Cancri	20	0.6	2.3	4.9	17.0	18.5	20.1	21.9	23.5	35.7	38.1	39.7	1 20.21	0.12	13.50	9 1 6.83	1.8
	O. Arg. S. 9789 .	21	43.0	44.8	47.7	1.4	3.2	5.0	6.9	8.8	22.6	25.3	27.0	25 5.06	0.04	13.50	9 24 51.60	1.3
	O. Arg. S. 9856 .	22	35.6	38.1	41.1	55.4	57.2	59.1	1.0	2.7	16.8	19.8	21.6	28 58.95	0.03	13.50	9 28 45.48	1.3
	O. Arg. S. 9938 .	23	. .	. .	. .	28.6	29.9	31.5	33.0	34.5	. .	. .	. .	32 31.50	0.03	13.51	9 32 18.02	1.5
	28 Ursæ Majoris . .	24	59.6	3.3	8.9	36.4	39.7	43.8	47.4	51.1	15.8	24.1	27.7	36 43.71	0.46	13.51	9 36 30.66	4.2
	*+18° 5′ . . .	25	48.0	49.5	52.2	4.6	6.4	8.1	9.9	11.5	24.0	26.7	28.2	45 8.10	0.13	13.51	9 44 54.72	2 1
	γ¹ Leonis	26	6.6	8.2	11.0	23.8	25.3	27.1	28.9	30.7	43.1	45.9	47.4	13 27.09	0.14	13.52	10 13 13.71	2.3
	* 35° 33 . . .	27	35.7	37.7	40.6	55.5	57.3	59.3	1.3	3.0	18.0	21.0	22.8	22 59.29	+ 0.02	13.52	10 22 45.79	1.6
	l Leonis	28	. .	. .	. .	59.7	1.5	3.2	4.8	6.4	18.6	21.2	22.5	43 9.74	− 6.47	13.52	10 42 49.75	2.2
	*−23° 40′ . . .	29	44.6	46.5	49.0	2.3	4.0	5.7	7.5	9.3	22.1	24.8	26.6	48 5.67	+ 0.04	13.52	10 47 52.19	1.8
	α Ursæ Majoris . .	30	43.6	47.4	52.5	18.0	21.6	25.0	28.5	31.9	57.8	3.0	6.3	56 25.06	0.42	13.53	. . . .	4.6
	Weisse 1076 . .	31	54.5	56.0	58.9	10.5	12.0	13.8	15.6	17.2	29.0	31.8	33.4	1 13.88	0.12	13.53	11 1 0.47	2.3
	δ Leonis	32	29.2	30.9	34.6	46.4	48.2	49.8	51.5	53.1	6.1	8.6	10.2	7 49.87	0.14	13.53	11 7 36.48	2.5
14	Weisse (2) 1255 .	33	28.0	31.1	32.8	34.5	37.2	. .	. .	. .	. .	. .	. .	51 32.72	37.32	13.84	8 51 56.20	1.9
	Weisse (2) 1258 .	34	55.0	56.8	58.6	12.7	14.3	15.9	17.9	19.6	32.5	35.2	36.9	52 15.95	0.11	13.84	8 52 2.22	1.9
	κ Cancri	35	1.0	2.5	5.1	17.2	18.8	20.4	22.1	23.8	36.0	38.4	40.0	1 20.48	0.10	13.84	9 1 6.74	1.7
	θ Hydræ	36	54.1	55.7	58.4	10.2	11.7	13.3	15.0	16.6	28.5	30.9	32.4	8 13.35	0.10	13.84	9 7 59.61	1.6
	38 Lyncis (2*). . .	37	3.0	5.0	8.2	23.2	25.0	27.0	29.1	31.3	46.2	49.2	51.0	11 27.11	0.13	13.84	9 11 13.40	2.3
	B. A. C. 3202 . .	38	52.9	54.6	57.2	9.2	10.7	12.3	14.0	15.7	27.7	30.2	31.7	17 12.38	0.10	13.84	9 16 58.64	1.8
	*−35° 22′ . . .	39	56.0	58.0	1.0	15.7	17.7	19.7	21.7	23.6	38.3	41.2	43.0	26 19.63	0.12	13.84	9 26 5.91	1.3
	O. Arg. S. 9855 .	40	34.7	36.8	39.6	53.6	55.4	57.2	59.0	1.1	15.2	18.1	19.7	28 57.31	0.12	13.84	9 28 43.59	1.3
	O. Arg. S. 9856 .	41	14.9	16.7	18.9	20.9	23.7	34.7	37.6	39.5	41.4	43.8	. .	28 59.21	+ 0.21	13.84	9 28 45.58	1.3
	*−23° 52 . . .	42	. .	. .	. .	. .	14.3	16.1	18.0	19.9	. .	. .	. .	31 17.07	− 0.78	13.84	9 31 2.45	1.4
	*−23° 52′ . . .	43	. .	. .	. .	. .	. .	. .	4.1	8.4	11.1	14.3	17.2	32 11.02	− 37.13	13.84	9 31 20.05	1.4
	28 Ursæ Majoris. .	44	0.0	3.7	9.8	37.0	40.3	44.2	48.1	51.4	19.1	24.8	28.1	36 44.23	+ 0.23	13.84	9 36 30.62	4.1
	*−39° 0′ . . .	45	. .	. .	. .	12.0	13.8	16.1	18.3	20.6	35.3	38.7	40.8	44 24.45	− 8 21	13.84	9 44 2.40	1.3
	Lacaille 4058 . .	46	27.0	28.7	31.3	45.0	46.8	48.6	50.5	52.0	5.6	8.4	10.0	48 48.54	+ 0.11	13.84	9 48 34.81	1.5
	*−34° 43′ . . .	47	. .	. .	. .	28.3	31.3	33.1	46.4	49.6	51.4	53.4	55.6	55 43.64	− 33.65	13.84	9 54 56.15	1.4
	Weisse (2) 1255 .	48	37.5	39.8	41.7	43.3	46.3	. .	55.9	59.0	0.8	2.7	4.9	0 21.19	+ 0.20	13.84	10 0 7.55	2.1
	Weisse (2) 1257 .	49	1.4	3.6	6.2	20.1	21.8	23.9	25.7	27.5	41.3	44.2	45.9	0 23.78	0.12	13.84	10 0 10.06	2.4
	γ¹ Leonis	50	6.9	8.7	11.3	23.9	25.7	27.4	29.2	30.9	43.5	46.2	47.8	13 77.41	+ 0.11	−13.84	10 13 13.68	2.3

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Apr. 12, 9.8	− 13.51	− 0.015	+ 0.12	+ 0.09
14, 9.6	− 13.84	0.000	0.00	+ 0.10

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
'77.														m. s.	s.	s.	h. m. s.	s.
r. 14	24 Sextantis	1	7.3	8.1	11.2	23.2	24.7	26.2	28.0	29.5	41.5	44.0	45.4	17 26.34	+ 0.10	−13.84	10 17 12.60	− 1.97
Y.	*−35° 33′	2	36.1	38.1	41.3	55.8	57.7	59.9	1.8	3.8	18.4	21.5	23.2	22 59.78	0.12	−13.84	10 22 46.06	1.64
y 15	*l* Leonis	3	28.5	30.2	32.8	44.8	46.3	48.0	49.7	51.3	3.5	6.1	7.5	42 48.06	0.13	+ 1.20	10 42 49.39	1.93
	B. A. C. 3864	4	48.8	52.6	58.5	26.6	30.4	34.0	38.0	41.8	10.1	16.0	19.2	15 34.18	0.47	1.22	11 15 35.87	4.08
	τ Leonis	5	18.1	19.8	22.3	34.3	35.8	37.4	39.0	40.6	52.6	55.2	56.5	21 37.42	0.12	1.22	11 21 38.76	2.04
	Weisse 347	6	0.2	2.2	3.8	5.6	7.9	. .	8.3	11.0	12.5	14.1	16.0	21 38.16	0.19	1.22	11 21 39.57	2.04
	Lalande 21902	7	15.1	17.0	20.3	35.2	37.2	39.3	41.2	43.2	58.1	1.3	3.1	25 39.18	0.21	1.22	11 25 40.61	2.64
	*−25° 18′	8	9.2	11.0	13.8	27.0	28.7	30.5	32.1	33.8	47.1	49.8	51.7	41 30.43	0.07	1.23	11 41 31.73	1.89
	*−25° 14′	9	19.8	21.5	24.4	37.5	39.0	40.9	42.9	44.8	57.5	0.3	2.0	42 40.96	0.07	1.23	11 42 42.26	1.89
	B. A. C. 4036	10	48.3	51.9	57.4	22.8	26.1	29.6	33.3	36.6	1.8	7.3	10.7	50 29.62	0.43	1.24	11 50 31.29	3.60
	Weisse 908	11	24.0	26.5	28.9	41.0	42.5	44.2	45.8	47.4	59.5	2.1	3.6	54 44.22	0.09	1.24	11 54 45.55	2.26
	Weisse 947	12	9.2	10.9	13.4	25.4	26.9	28.5	30.2	31.9	44.0	46.5	48.1	56 28.64	0.09	1.24	11 56 29.97	2.27
	η Virginis	13	18.5	20.1	22.6	34.6	36.0	37.7	39.5	41.0	52.9	55.4	56.7	13 37.73	0.11	1.25	12 13 39.09	2.26
	6 Draconis	14	36.5	41.4	49.0	25.5	30.0	34.7	39.8	44.4	20.6	27.9	32.5	29 34.75	0.62	1.27	12 29 36.64	5.37
	10 Canum Venat.	15	46.5	48.4	51.6	7.3	9.2	11.4	13.6	15.6	31.2	34.4	36.5	39 11.43	0.23	1.27	12 39 12.93	3.01
	11 Canum Venat.	16	34.4	37.0	40.7	58.9	1.1	3.7	6.2	8.7	26.9	30.6	32.8	43 3.73	0.28	1.27	12 43 5.28	3.36
	θ Virginis	17	16.7	18.4	20.9	32.9	34.4	36.0	37.7	39.3	51.3	53.7	55.2	3 36.05	+ 0.10	1.29	13 3 37.44	− 2.45
	Polaris, S. P.	18	. .	. .	. .	38.0	41.0	55.0	4.0	8.0	. .	. .	. .	12 53.80	− 8.32	1.29	. . . .	+ 55.44
	α Virginis	19	24.5	26.1	28.8	40.8	42.3	44.0	45.7	47.2	59.5	1.9	3.4	18 44.02	+ 0.09	1.29	13 18 45.40	− 2.49
18	B. A. C. 3864	20	44.7	48.8	54.6	22.9	26.6	30.3	34.2	37.9	6.4	12.0	15.4	15 30.35	0.26	5.10	11 15 35.71	3.94
	τ Leonis	21	14.2	15.9	18.4	30.3	31.9	33.5	35.2	36.7	48.7	51.3	52.7	21 33.53	0.11	5.10	11 21 38.74	2.01
	Lalande 21902	22	11.4	13.5	16.6	31.5	33.5	35.5	37.5	39.6	54.5	57.5	59.3	25 35.49	0.14	5.10	11 25 40.73	2.59
	3 Draconis	23	44.5	48.8	55.3	26.5	30.5	34.5	39.0	43.1	14.4	20.5	24.3	35 34.67	0.29	5.11	11 35 40.07	4.39
	*−25° 16′	24	58.7	0.7	3.4	16.6	18.1	20.0	21.7	23.5	36.9	39.6	41.2	42 20.04	0.12	5.11	11 42 25.27	1.86
	B. A. C. 4021	25	23.6	25.3	27.7	39.7	41.3	43.0	44.6	46.2	58.2	0.7	2.2	47 42.95	0.11	5.11	11 47 48.17	2.17
	o Virginis	26	34.1	35.7	38.4	50.5	52.1	53.7	55.4	57.0	8.9	11.5	12.9	58 53.65	0.11	5.11	11 58 58.87	2.27
	B. A. C. 4153	27	44.2	46.2	49.2	2.3	3.8	5.7	7.7	9.5	22.9	25.7	27.5	14 5.88	0.12	5.12	12 14 11.12	2.59
	6 Draconis	28	32.4	37.2	35.3	21.3	25.8	30.7	35.8	40.5	16.6	23.9	28.2	29 30.70	0.33	5.12	12 29 36.15	5.25
	10 Canum Venat.	29	42.4	44.6	48.0	3.5	5.4	7.5	9.8	11.7	27.2	30.6	32.6	39 7.57	0.14	5.13	12 39 12.84	2.97
	11 Canum Venat.	30	30.6	33.0	37.0	54.9	57.4	0.0	2.7	4.9	23.0	26.6	28.9	42 59.91	0.17	5.13	12 43 5.21	3.31
	B. A. C. 4331	31	38.8	40.7	. .	0.8	3.0	5.2	7.3	9.2	. .	28.8	31.1	48 4.99	0.14	5.13	12 48 10.26	2.36
	θ Virginis	32	12.9	14.7	17.0	29.0	30.5	32.2	33.9	35.5	47.3	49.8	51.2	3 32.18	+ 0.11	5.14	13 3 37.43	− 2.43
	Polaris, S. P.	33	. .	. .	. .	32.0	37.0	46.0	58.0	4.0	. .	. .	. .	12 47.40	− 3.97	5.14	. . . .	+ 53.64
	α Virginis	34	20.6	22.3	25.0	37.0	38.4	40.1	41.8	43.4	55.6	58.1	59.7	18 40.18	+ 0.11	5.14	13 18 45.43	− 2.48
	Weisse 566	35	45.6	47.1	49.7	. .	. .	. .	. .	. .	20.2	22.4	24.0	34 4.83	0.12	5.15	13 34 10.10	2.56
	Weisse 569	36	8.0	9.6	12.0	. .	. .	. .	. .	. .	42.6	45.1	46.8	34 27.35	0.12	5.15	13 34 32.62	2.56
	Weisse 630	37	21.8	2	25.5	38.3	40.0	41.6	43.1	44.8	57.0	0.1	1.8	37 41.59	0.11	5.15	13 37 46.85	2.57
	Weisse 654	38	54.4	56.0	58.5	10.8	12.2	14.0	15.6	17.1	29.5	32.1	33.6	39 13.98	0.11	5.15	13 39 19.24	2.58
	O. Arg. S. 13159	39	49.1	51.0	53.5	6.5	8.1	9.8	11.6	13.2	25.8	28.4	30.0	42 9.73	0.12	5.15	13 42 15.00	2.60
	*−37° 47′	40	4.3	6.6	9.8	24.7	26.4	28.8	31.0	32.9	48.0	51.0	53.0	49 28.77	0.14	5.15	13 49 34.06	2.79
	Weisse 942	41	24.8	26.3	28.6	40.8	42.1	43.9	45.7	47.2	59.2	1.5	2.9	57 43.91	0.11	5.15	13 57 49.17	2.66
	α Bootis	42	40.1	41.8	44.5	57.3	58.9	0.5	2.2	3.8	16.6	19.3	20.9	10 0.54	0.12	5.16	14 10 5.82	2.77
	Weisse 257	43	29.2	31.1	33.3	45.5	47.2	48.8	51.0	52.8	. .	. .	. .	15 42.36	6.60	5.16	14 15 54.12	2.70
ıe 16	5 Ursæ Minoris	44	12.3	18.5	28.4	18.5	25.4	32.0	39.0	45.5	35.5	45.5	52.9	27 32.14	+ 0.20	21.53	14 27 53.87	5.30
	ω² Libræ	45	26.2	27.6	30.3	42.8	44.4	46.0	47.6	49.3	1.8	4.3	5.9	43 46.02	− 0.05	21.53	14 44 7.50	2.87
	β Ursæ Minoris	46	36.1	41.5	50.9	36.4	42.1	48.3	54.3	0.4	45.2	54.6	1.0	50 48.25	+ 0.18	21.53	14 51 9.96	4.97
	*+10° 24′	47	8.2	9.5	11.8	24.3	25.7	27.1	28.9	30.7	. .	. .	. .	57 20.77	+ 6.57	21.53	14 57 48.87	2.83
	O. Arg. S. 14487	48	19.5	21.3	24.1	38.0	39.6	41.5	43.4	45.2	58.8	1.7	3.9	14 41.55	− 0.08	21.53	15 15 3.00	3.21
	O. Arg. S. 14490	49	. .	. .	. .	14.3	17.4	19.6	32.1	34.9	36.6	38.5	40.9	15 29.29	− 32.23	21.53	15 15 18.59	3.21
	Radcliffe 3387	50	26.8	28.7	32.3	48.9	51.0	53.4	55.7	57.9	14.7	18.1	20.3	21 53.44	+ 0.04	+21.53	15 22 15.01	− 3.10

May 19. Image west $0^{r}.55$; clamp west.
Image west $0^{r}.87$; clamp east.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
May 15, 12.1	+ 1.25	+ 0.038	+ 0.10	+ 0.11
18, 12.8	+ 5.13	+ 0.021	0.00	+ 0.11
June 16, 16.2	+ 21.53	000	− 0.03	+ 0.08

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductio to 1877.0
			I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	s.	s.	h. m. s.	s.
June 16 Y.	*−36° 2′	1	15.3	16.9	20.1	35.2	36.7	38.7	40.9	42.6	57.5	0.3	2.5	31 38.79	− 0.09	+21.53	15 32 0.23	− 3.4
	Lalande 28740	2	10.1	13.7	19.9	49.5	53.6	57.5	1.6	5.5	35.1	41.0	45.3	36 57.53	+ 0.11	21.53	15 37 19.17	3.9
	ε Serpentis	3	3.6	5.0	7.5	19.3	20.7	22.6	24.3	25.8	37.8	40.2	41.8	44 22.60	− 0.02	21.53	15 44 44.11	3.0
	ε Coronæ Borealis	4	49.6	51.4	54.2	9.6	9.4	11.3	13.0	14.7	28.1	30.9	32.8	52 11.18	+ 0.01	21.53	15 52 32.72	2.9
	Lacaille 6686	5	29.8	31.6	34.5	49.3	51.5	53.6	55.5	57.4	. .	. .	. .	58 45.40	+ 7.96	21.53	15 59 14.89	3.6
	*−36° 24′	6	. .	. .	. .	8.0	10.0	12.0	14.1	15.9	30.6	33.8	36.0	59 20.05	− 8.13	21.53	15 59 33.45	3.6
	*+37° 12′	7	25.2	27.0	30.2		46.9	49.0	51.1	53.1	7.9	11.3	13.2	12 49.09	+ 0.02	21.53	16 13 10.64	3.0
	γ² Coronæ Borealis	8	9.5	11.4	14.2	28.7	30.6	32.8	34.5	36.5	50.8	53.8	55.8	17 32.60	+ 0.02	21.53	16 17 54.15	3.0
	*−33° 11′	9	29.8	31.5	34.5	48.7	50.6	52.6	54.6	56.4	10.7	13.9	15.5	23 52.62	− 0.09	21.53	16 24 14.06	3.7
	Lacaille 6871	10	. .	. .	. .	40.8	42.7	44.6	46.7	48.5	2.6	5.7	7.6	24 52.40	7.83	21.53	16 25 6.10	3.7
	O. Arg. S. 15788	11	28.8	30.3	33.0	46.2	47.8	49.6	51.3	53.2	6.2	8.7	10.5	30 49.60	− 0.07	21.53	16 31 11.06	3.4
	Radcliffe 3588.	12	23.5	25.8	29.8	. .	. .	. .	. .	. .	15.8	19.6	22.1	34 52.77	+ 0.04	21.53	16 35 14.34	3.1
	42 Herculis	13	37.0	39.3	43.2	. .	. .	. .	. .	. .	29.4	33.1	35.6	35 6.27	0.04	21.53	16 35 27.84	3.1
	*−40° 28′	14	50.8	52.9	56.2	12.6	14.5	16.5	18.4	20.2	. .	. .	. .	43 7.76	+ 8.41	21.53	16 43 37.70	4.0
	B. A. C. 5639	15	. .	. .	. .	33.2	35.7	38.0	40.2	42.3	. .	. .	. .	43 37.88	− 0.10	21.53	16 43 59.31	4.0
	*−31° 8′	16	35.0	37.0	39.6	53.8	55.7	57.5	59.5	1.2	15.2	18.0	19.9	46 57.49	− 0.08	21.53	16 47 18.94	3.7
	Weisse (2) 1735	17	36.5	38.1	40.9	54.2	55.8	57.7	59.6	1.2	14.4	17.1	18.9	56 57.67	0.00	21.53	16 57 19.20	3.0
	ε Ursæ Minoris.	18	. .	. .	. .	. .	. .	. .	. .	. .	14.5	33.4	45.7	0 31.20	− 2 7.46	21.53	. . . .	7.0
	a¹ Herculis	19	24.3	25.8	28.4	40.6	42.2	44.0	45.7	47.2	59.5	2.1	3.8	8 43.96	0.01	21.53	17 9 5.48	3.0
	*−24° 50′	20	5.9	7.6	10.3	23.4	24.9	26.8	28.6	30.2	43.5	46.1	48.2	14 26.86	0.07	21.53	17 14 48.32	3.6
	*−31° 31′	21	59.5	1.0	4.0	18.2	19.7	21.9	23.8	25.6	39.7	42.3	44.5	18 21.84	0.08	21.53	17 18 43.29	3.8
	B. A. C. 5916	22	33.1	34.7	37.6	51.5	53.1	55.0	56.9	58.5	12.4	15.4	17.1	24 55.03	0.08	21.53	17 25 16.48	3.8
	a Ophiuchi	23	45.5	47.0	49.4	51.7	53.3	55.0	56.7	58.2	10.5	13.2	14.8	28 55.03	− 0.01	21.53	17 29 16.55	− 3.0
19	Polaris, S. P.	24	. .	. .	. .	38.0	42.0	51.0	1.0	6.0		. .	. .	12 51.60	+ 0.46	22.59	. . . .	+ 27.6
	a Virginis	25	. .	. .	. .	19.5	21.0	22.7	24.4	25.9	38.1	40.6	42.3	18 29.31	− 6.61	22.59	13 18 45.29	− 2.3
	Lacaille 5710	26	53.1	54.8	57.5	10.5	12.2	14.0	15.9	17.5	30.4	33.3	35.1	44 14.03	0.03	22.60	13 44 36.60	2.5
	η Bootis	27	9.4	11.1	13.6	26.2	27.9	29.7	31.4	32.9	45.6	48.2	50.0	48 29.64	0.03	22.61	13 48 52.22	2.5
	B. A. C. 4671	28	41.9	43.4	46.4	59.9	1.5	3.4	5.2	7.0	20.2	23.0	24.8	55 3.34	0.03	22.61	13 55 25.92	2.6
	Lacaille 5824	29	48.2	49.6	52.7	7.1	8.9	10.9	12.7	14.7	29.3	32.4	34.3	0 10.98	0.03	22.62	14 0 33.57	2.7
	B. A. C. 4714	30	10.6	12.5	15.2	29.5	31.3	33.4	35.2	37.0	51.1	54.4	56.1	5 33.30	0.03	22.62	14 5 55.89	2.7
	Weisse 173	31	50.9	52.3	54.9	7.0	8.4	10.1	11.8	13.3	25.3	27.8	29.4	11 10.11	− 0.03	22.62	14 11 32.70	2.6
	Weisse 257	32	12.1	13.5	15.9	28.3	29.8	31.3	32.9	34.6	. .	. .	. .	15 24.80	+ 6.47	22.62	14 15 53.89	2.6
	O. Arg. S. 13626	33	30.4	32.0	34.7	48.4	50.0	51.8	53.7	55.5	8.8	10.7	13.6	19 51.78	− 0.03	22.63	14 20 14.38	2.8
	O. Arg. S. 13629	34	39.0	40.7	43.5	. .	. .	. .	. .	. .	17.7	20.5	22.4	20 0.63	0.04	22.63	14 20 23.22	2.8
	*−34° 8′	35	. .	. .	. .	19.2	21.2	22.7	24.9	27.0	. .	. .	. .	25 23.00	0.02	22.63	14 25 45.61	2.9
	*−34° 6′	36	2.1	4.0	6.9	. .	. .	. .	. .	. .	43.6	46.4	48.4	25 25.23	0.04	22.63	14 25 47.82	2.9
	*+37° 41′	37	. .	. .	. .	. .	. .	. .	33.3	34.7	36.5	38.6	41.1	29 36.44	43.24	22.63	14 29 15.83	2.8
	ζ Bootis	38	36.9	38.4	40.9	53.3	54.8	56.6	58.2	59.8	12.1	14.8	16.5	34 56.57	0.03	22.63	14 35 19.17	2.7
	a² Libræ	39	25.0	26.6	29.1	41.5	43.1	44.9	46.5	48.2	0.4	3.0	4.8	43 44.83	− 0.03	22.64	14 44 7.44	2.8
	Weisse 1091	40	45.8	47.3	49.8	1.9	3.5	5.3	6.9	8.5	. .	. .	. .	58 58.62	+ 6.56	22.64	14 59 27.82	2.9
	Lacaille 6261	41	13.1	14.8	18.0	33.3	35.1	37.2	39.1	41.1	55.9	59.2	1.1	4 37.08	− 0.03	22.65	15 4 59.70	3.3
	*−37° 2′	42	34.4	36.2	39.1	54.3	56.4	58.3	0.4	2.1	17.1	20.0	20.9	7 58.11	0.03	22.65	15 8 20.73	3.3
	Radcliffe 3387.	43	25.5	27.6	31.3	48.0	50.0	52.4	54.7	56.7	13.4	16.9	19.2	21 52.34	− 0.03	22.65	15 22 14.96	3.0
	Lacaille 6421	44	45.9	47.5	50.5	4.7	6.5	8.5	10.4	12.2	. .	. .	. .	26 0.78	+ 7.67	22.66	15 26 31.11	3.3
	*−15° 33′	45	13.6	15.0	17.6	30.4	31.8	33.4	35.1	36.5	. .	. .	. .	33 26.68	+ 6.70	22.66	15 33 56.05	3.1
	Lalande 28740	46	9.1	12.6	18.9	48.2	52.3	56.3	0.6	4.3	33.8	40.0	44.2	36 56.39	− 0.05	22.66	15 37 19.00	3.8
	Weisse 825	47	20.1	21.5	24.1	36.0	37.6	39.3	40.9	42.4	54.4	57.1	58.5	43 39.26	0.03	22.67	15 44 1.90	3.0
	Lalande 28926	48	. .	. .	. .	20.1	23.2	25.2	39.2	42.5	44.4	46.7	49.0	46 36.29	35.34	22.67	15 46 23.62	3.0
	ε Coronæ Borealis	49	48.5	50.3	52.9	6.4	8.2	10.1	11.9	13.6	26.9	29.9	31.7	52 10.04	0.33	22.67	15 52 32.68	2.9
	Lacaille 6686	50	28.4	30.4	33.4	. .	. .	. .	. .	. .	10.9	14.0	16.0	58 52.18	− 0.04	+22.67	15 59 14.81	− 3.6

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
June 19, 14.8	+ 22.64	+ 0.030	+ 0.01	− 0.03
20, 15.8	− 21.06	− 0.021	− 0.04	− 0.05

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX	X.	XI.	Mean wire.	Inst.	Clock.		
77.														m. s.	s.	s.	h. m. s.	s.
e 19	*−36° 24′ . . .	1	47.3	49.2	52.1	. .	. .	. .	. .	. .	29.7	32.9	34.9	59 11.02	− 0.04	+22.68	15 59 33.66	− 3.68
′.	δ Ophiuchi . . .	2	15.4	16.9	19.4	31.3	33.5	34.5	36.1	37.6	49.6	52.2	53.8	7 34.60	0.03	+22.68	16 7 57.25	− 3.11
20	Polaris, S.P. . .	3	. .	. .	. .	. .	. .	. .	53.0	44.0	49.0	0.0	20.0	37 45.20	24 10.48	−21.01	. . . .	+ 25.63
	Lacaille 5710 . .	4	36.8	38.5	41.2	54.3	56.0	57.8	59.5	1.2	14.2	16.9	18.7	44 57.74	0.04	21.02	13 44 36.68	− 2.51
	η Bootis	5	53.0	54.8	57.3	10.0	11.6	13.4	15.1	16.7	29.4	32.0	33.7	49 13.36	0.07	21.02	13 49 52.27	2.57
	α Coronæ Borealis .	6	31.5	33.3	35.9	49.4	51.1	53.1	54.8	56.6	9.8	12.6	14.5	29 52.96	0.08	21.05	15 29 31.83	2.94
	*−15° 34′ . . .	7	. .	. .	. .	14.3	15.6	17.3	18.9	20.6	33.2	35.7	37.4	34 24.12	6.76	21.06	15 33 56.30	3.13
	Weisse 792 . .	8	57.9	59.4	2.0	. .	15.8	17.5	19.3	. .	33.2	35.9	37.8	43 17.64	0.04	21.06	15 42 56.54	3.15
	Lalande 28926. .	9	20.7	22.6	25.6	40.9	42.8	45.0	47.0	48.9	3.9	7.2	9.1	46 44.88	0.10	21.06	15 46 23.72	3.02
	ε Coronæ Borealis .	10	32.5	34.1	36.9	50.2	52.0	53.9	55.7	57.5	10.9	13.7	15.5	52 53.90	0.08	21.06	15 52 32.76	2.97
	Lalande 29341. .	11	34.6	36.4	39.3	53.8	55.8	57.7	59.7	1.5	16.0	19.1	21.1	59 57.73	0.03	21.06	15 59 36.64	3.01
	δ Ophiuchi . . .	12	59.3	0.7	3.2	15.1	16.8	18.5	20.1	21.6	33.5	36.0	37.7	8 18.41	0.05	21.07	16 7 57.29	3.12
	*+37° 12′ . . .	13	8.5	10.2	13.2	28.4	30.2	32.4	34.3	36.0	51.1	54.5	56.4	12 32.29	0.09	21.07	16 12 11.13	3.04
	*+37° 14′ . . .	14	8.0	9.7	12.9	27.7	29.7	32.0	34.2	35.8	50.8	54.0	56.1	13 31.90	0.09	21.07	16 13 10.74	3.04
	γ^2 Coronæ Borealis .	15	52.5	54.1	57.0	11.6	13.4	15.4	17.4	19.3	33.7	36.7	38.6	18 15.43	0.09	21.07	16 17 54.27	3.02
	ζ Ophiuchi . . .	16	28.3	29.8	32.4	44.4	46.0	47.7	49.3	50.8	3.0	5.4	7.2	30 47.66	0.04	21.07	16 30 26.55	3.27
	Radcliffe 3588 . .	17	. .	. .	. .	58.9	2.5	5.1	21.9	25.6	28.3	30.8	33.9	36 18.37	42.66	21.08	16 35 14.63	3.16
	*−30° 1′ . . .	18	20.1	21.8	24.9	38.6	40.5	42.3	44.3	46.1	59.7	2.7	4.5	50 42.32	0.04	21.08	16 50 21.20	3.75
	*+25° 52′ . . .	19	51.2	52.7	55.6	8.7	10.5	12.4	14.2	15.9	28.9	31.8	33.6	56 12.32	0.08	21.08	16 55 51.16	3.03
	*+25° 51′ . . .	20	57.1	58.8	1.6	14.9	16.6	18.3	20.3	22.1	35.1	37.9	39.6	58 18.39	0.08	21.08	16 57 57.23	3.03
	ε Ursæ Minoris. .	21	. .	. .	. .	. .	. .	. .	50.5	8.6	20.5	32.9	47.1	3 19.92	4 14.12	21.08	. . . .	6.81
	α Herculis . . .	22	7.0	8.5	11.0	23.3	24.9	26.6	28.5	30.0	42.3	44.8	46.6	9 26.68	0.06	21.09	17 9 5.53	3.08
22	α Coronæ Borealis .	23	32.9	34.6	37.5	50.8	52.5	54.5	56.2	57.9	11.3	14.2	15.9	29 54.39	0.03	22.65	15 29 31.71	2.93
	α Serpentis . . .	24	18.9	20.5	22.9	35.1	36.6	38.4	40.9	41.5	53.6	56.0	57.8	38 38.38	0.04	22.65	15 38 15.69	2.97
	Weisse 792 . .	25	. .	1.0	2.5	16.1	17.7	19.2	21.0	22.4	34.8	37.5	. .	43 19.13	0.09	22.66	15 42 56.38	3.13
	B. A. C. 5255 . .	26	18.5	20.1	22.8	36.3	38.0	39.7	11.5	43.1	56.2	59.0	0.9	46 39.65	0.09	22.66	15 46 16.90	3.33
	49 Libræ	27	31.4	32.9	35.7	48.0	49.6	51.3	53.1	54.8	7.0	9.6	11.5	53 51.35	0.07	22.68	15 53 28.60	3.21
	β^1 Scorpii	28	22.9	24.5	27.2	39.9	41.6	43.2	45.0	46.6	59.0	1.9	3.6	58 43.22	0.07	22.69	15 58 20.46	3.30
	B. A. C.5347 . .	29	42.9	44.5	47.3	0.6	2.5	4.3	6.2	7.8	21.0	23.8	25.5	1 4.22	0.09	22.69	16 0 41.44	3.43
	48 Serpentis . . .	30	0.4	2.0	4.5	17.0	18.6	20.4	21.9	23.6	36.1	38.8	40.5	6 20.35	0.03	22.69	16 5 57.63	2.99
	Lacaille 6765 . .	31	30.1	32.1	34.6	49.3	51.2	53.2	55.4	57.5	11.6	14.6	16.6	9 53.29	0.10	22.70	16 9 30.49	3.69
	*+37° 12′ . . .	32	. .	. .	. .	29.5	31.3	33.5	35.5	37.4	52.6	55.7	57.9	12 41.68	8.15	22.70	16 12 10.83	3.03
	B. A. C. 5471 . .	33	55.7	57.4	0.2	14.4	16.0	18.0	19.9	21.7	35.6	38.7	40.3	18 17.99	0.10	22.71	16 17 55.18	3.65
	*−33° 13′ . . .	34	13.9	15.6	18.6	33.0	34.8	36.9	38.7	40.7	54.9	57.8	59.7	24 36.78	0.10	22.72	16 24 13.96	3.74
	ζ Ophiuchi . . .	35	29.9	31.4	33.7	15.8	47.3	49.1	50.7	52.4	4.5	6.9	8.9	30 49.15	0.06	22.72	16 30 26.37	3.27
	Radcliffe 3588 . .	36	8.1	10.5	14.2	. .	. .	. .	. .	. .	0.3	4.1	6.7	35 37.32	0.02	22.73	16 35 14.57	3.15
	42 Herculis . . .	37	21.2	23.6	27.3	. .	. .	. .	. .	. .	13.5	17.3	19.9	35 50.47	0.02	22.73	16 35 27.72	3.15
	Weisse (2) 1735 .	38	20.7	22.5	25.2	38.4	40.2	42.2	44.0	45.6	58.6	1.6	3.2	57 42.01	0.03	22.76	16 57 19.22	3.03
	ε Ursæ Minoris. .	39	. .	. .	. .	. .	. .	. .	. .	. .	58.5	16.7	29.4	1 14.87	2 7.80	22.76	16 58 44.31	6.68
	Lacaille 7171 . .	40	58.8	0.4	3.6	19.3	21.5	23.5	25.6	27.6	43.1	46.5	48.2	6 23.55	0.11	22.77	17 6 0.67	4.18
	*+ 2° 9′ . . .	41	50.8	52.2	54.8	. .	. .	. .	. .	. .	24.9	27.4	29.0	20 9.85	0.06	22.79	17 19 47.00	3.22
	*+ 2° 8′ . . .	42	7.2	8.8	11.0	. .	. .	. .	. .	. .	41.3	43.8	45.6	20 26.28	0.06	22.79	17 20 3.43	3.22
	*−38° 32′ . . .	43	46.4	48.1	51.1	6.7	8.4	10.7	12.7	14.8	30.1	33.1	35.1	27 10.65	0.11	22.80	17 26 47.74	4.22
	*−38° 31′ . . .	44	. .	. .	. .	59.7	3.0	4.8	19.2	22.4	24.4	26.3	28.9	28 16.09	35.71	22.80	17 27 17.58	4.22
	*−34° 24′ . . .	45	40.5	42.2	45.4	59.8	1.4	3.5	5.6	7.4	21.8	25.1	26.7	36 3.58	0.10	22.81	17 35 40.67	4.07
	*−34° 48′ . . .	46	19.8	21.7	24.6	39.2	41.0	43.0	44.9	46.9	1.2	4.6	6.3	38 43.02	0.10	22.81	17 38 20.11	4.09
	*−34° 48′ . . .	47	24.7	26.3	28.4	30.4	32.2	46.7	50.0	51.9	. .	. .	. .	39 36.32	7.98	22.81	17 39 5.53	4.10
	O. Arg. S. 17349 .	48	. .	. .	. .	19.2	21.0	22.7	24.7	26.4	39.5	42.4	44.3	48 30.02	7.34	22.83	17 47 59.85	3.84
	*−24° 9′ . . .	49	5.6	7.1	9.6	23.5	25.3	27.0	28.7	30.5	. .	. .	. .	54 19.67	+ 7.02	22.83	17 54 3.86	3.76
	O. Arg. S. 17489 .	50	. .	. .	. .	41.5	43.3	45.4	47.0	48.8	1.8	4.4	6.3	54 52.31	− 7.17	−22.83	17 54 22.31	− 3.76

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
June 22, 16.3	− 22.71	− 0.078	− 0.06	− 0.05

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductio to 1877.
														m. s.	s.	s.	h. m. s.	s.
1877. June 22 Y.	*−23° 36′	1	25.0	26.4	29.2	42.2	43.6	45.5	47.2	48.7	2.0	4.7	6.6	57 45.55	− 0.08	−22.84	17 57 22.63	− 3.7
	μ Sagittarii	2	30.6	32.2	34.8	47.8	49.4	51.2	52.9	54.5	7.2	9.9	11.7	6 51.11	− 0.08	22.85	18 6 29.18	3.7
	δ Ursæ Minoris	3	. .	. .		39.0	5.0	35.0	1.0	28.0	. .	. .	. .	12 33.60	+ 0.37	22.86	. . . .	10
23	*−34° 8′	4	46.4	48.2	2	5.7	7.5	9.5	11.5	13.4	27.7	30.8	32.6	26 9.50	− 0.07	23.53	14 25 45.90	2.8
	*+34° 8′	5	25.8	28.1	30.1	32.1	35.2	. .	47.8	50.9	53.1	55.0	57.3	26 11.54	0.16	23.53	14 25 47.85	2.8
	*+37° 42′	6	29.5	31.4	33.6	49.6	51.5	53.4	55.6	57.7	12.7	15.7	1 .7	29 53.58	0.08	23.54	14 29 29.96	2.8
	Weisse (2) 752	7	6.2	8.2	4	26.7	28.7	30.8	32.8	34.9	50.0	53.3	5 .3	36 30.75	0.08	23.55	14 36 7.12	2.8
	ε Bootis	8	41.8	43.6	46.3	59.8	1.5	3.4	5.2	7.0	20.3	23.1	2 .9	40 3.35	0.07	23.56	14 39 39.72	2.7
	Weisse (2) 932	9	52.6	54.4	57.4	. .	. .	. .	. .	. .	35.0	38.0	40.0	44 16.23	0.08	23.56	14 43 52.59	2.8
	Weisse (2) 936	10	8.3	10.2	13.2	. .	. .	. .	. .	. .	51.0	54.0	56.1	44 32.13	− 0.08	23.56	14 44 8.49	2.8
	*+10° 25′	11	6.9	8.4	10.4	22.8	24.3	26.1	27.6	28.9	. .	. .	. .	57 19.42	+ 6.53	23.59	14 57 2.36	2.8
	Weisse 1091	12	32.1	33.6	36.2	48.2	49.8	51.5	53.2	54.8	. .	. .	. .	59 44.92	+ 6.53	23.59	14 59 27.86	2.8
	*−37° 0′	13	28.6	30.6	33.6	48.5	50.8	52.5	54.8	57.6	11.6	14.7	16.8	2 52.74	− 0.08	23.60	15 2 29.06	3.2
	Lacaille 6261	14	59.5	0.2	4.5	19.3	21.4	23.5	25.4	27.4	42.4	45.6	47.4	5 23.33	− 0.08	23.60	15 4 59.45	3.2
	*−37° 2′	15	20.8	22.4	25.5	40.6	42.4	44.3	46.5	48.4	. .	. .	. .	8 36.36	+ 8.04	23.61	15 8 20.79	3.3
	Lacaille 6342	16	37.6	39.4	4 3	56.4	58.2	0.2	2.1	4.8	17.9	20.8	22.7	15 0.22	− 0.07	23.62	15 14 36.53	3.2
	Weisse (2) 435	17	44.9	46.5	49.7	4.8	6.8	8.9	10.9	12.7	27.9	31.1	33.1	21 8.85	0.08	23.63	15 20 45.14	2.9
	Lacaille 6406	18	9.6	11.3	14.0	28.4	30.1	32.1	34.1	35.8	49.8	53.0	54.9	24 32.10	0.07	23.63	15 21 8.41	3.3
	Lalande 28740	19	55.3	59.0	4	34.7	38.6	42.8	46.8	50.5	20.0	26.2	30.4	37 42.70	0.15	23.66	15 37 18.89	3.7
	B. A. C. 5255	20	19.8	21.3	24.1	37.4	38.9	40.8	42.6	44.3	57.5	0.2	1.9	46 40.80	0.07	23.67	15 46 17.06	3.3
	49 Libræ	21	32.6	34.2	36.7	49.1	50.7	52.5	54.2	55.7	8.1	10.9	12.6	53 52.48	0.06	23.68	15 53 28.74	3.2
	Lacaille 6686	22	14.8	16.6	19.7	. .	. .	. .	. .	. .	57.3	0.5	2.6	59 38.58	0.08	23.70	15 59 14.80	3.6
	* 36° 24′	23	33.7	35.5	38.5	. .	. .	. .	. .	. .	16.0	19.1	21.3	59 57.35	− 0.08	23.70	15 59 33.57	3.6
	*−17° 48′	24	21.1	22.9	25.2	37.8	39.2	40.9	42.5	44.0	. .	. .	. .	3 34.20	+ 6.74	23.70	16 3 17.24	3.2
	O. Arg. S. 15342	25	18.0	19.5	22.1	34.8	36.4	38.1	39.8	41.5	54.0	56.6	58.4	4 38.11	− 0.06	23.71	16 4 14.34	3.2
	δ Ophiuchi	26	1.9	3.5	5.8	17.7	19.3	21.0	22.6	24.2	36.1	38.6	40.3	8 21.00	0.06	23.71	16 7 57.22	3.1
	*+37° 12′	27	10.7	12.7	15.7	30.6	32.6	34.6	36.7	38.7	53.6	56.9	58.7	12 31.68	0.08	23.72	16 12 10.88	3.0
	B. A. C. 5471	28	56.4	58.0	1.1	14.9	16.8	18.7	20.7	22.4	36.4	39.5	41.4	18 18.75	0.07	23.73	16 17 54.95	3.6
	*−33° 13′	29	15.2	16.9	19.7	34.1	35.8	37.7	39.7	41.5	56.0	58.8	0.7	24 37 83	0.07	23.74	16 24 14.02	3.7
	ζ Ophiuchi	30	30.9	32.5	34.9	46.8	48.5	50.2	51.9	53.4	5.5	8.2	9.7	30 50.23	0.06	23.75	16 30 26.42	3.2
	*−30° 14′	31	18.0	19.8	22.7	. .	. .	. .	. .	. .	57.7	0.6	2.5	34 40.22	0.08	23.76	16 34 16.38	3.7
	B. A. C. 5572	32	. .	. .	. .	40.5	42.6	44.5	46.4	48.3	. .	. .	. .	34 44.48	0.06	23.76	16 34 20.66	3.7
	B. A. C. 5622	33	38.0	39.7	42.7	56.5	58.5	0.2	2.3	4.1	17.9	20.8	22.7	41 0.32	0.07	23.77	16 40 36.48	3.7
	*−30° 1′	34	22.9	24.7	27.3	4 3	43.0	45.0	46.7	48.7	2.2	5.3	7.1	50 44.93	0.07	23.78	16 50 21.08	3.7
	*−29° 54′	35	. .	. .	. .	31.6	34.5	36.3	49.2	52.2	53.8	55.8	57.9	51 46.44	32.20	23.79	16 50 50.45	3.7
	*−36° 59′	36	14.5	16.2	19.3	.	.	.	. .	. .	57.0	0.6	2.3	55 38.32	0.09	23.80	16 55 14.43	4.0
	*−36° 59′	37	24.3	26.0	29	.	.	.	. .	. .	7.0	10.1	12.2	55 48.12	0.09	23.80	16 55 24.23	4.0
	ε Ursæ Minoris	38	. .	.	.	45.0	56.4	8.6	21.1	33.5	. .	. .	. .	59 8.92	0.37	23.81	. . . .	6.6
	Lacaille 7171	39	59.7	1.5	4.6	20.4	22.1	24.5	26.4	28.6	43.9	47.2	49.5	6 24.40	0.08	23.82	17 6 0.50	4.1
	α Herculis	40	9.6	11.1	13.7	26.1	27.6	29.4	31.0	32.6	44.9	47.4	49.1	9 29.32	0.06	23.82	17 9 5.44	3.1
	w Herculis	41	7.7	9.4	12.4	26.7	28.4	30.4	32.2	34.1	48.2	51.2	53.1	16 30.35	0.07	23.83	17 16 6.45	3.0
	*+2° 12′	42	51.7	53.2	55.5			.	. .	. .	26.0	28.2	30.1	20 10.78	0.07	23.84	17 19 46.87	3.2
	*+2° 12′	43	8.1	9.7	12.1			. .	. .	. .	42.4	45.0	46.5	20 27.30	0.07	23.84	17 20 3.39	3.2
	α Ophiuchi	44	20.9	22.4	25.0	37.2	38.7	40.5	42.1	43.7	55.9	59.5	0.2	29 40.55	− 0.06	23.86	17 29 16.63	3.1
July 2	Weisse (2) 435	45	46.7	48.6	51.8	6.6	8.6	10.6	12.6	14.4	. .	. .	. .	21 2.49	+ 8.10	25.63	15 20 44.96	2.8
	*+32° 46′	46	55.5	57.2	0.2	14.4	16.3	. .	20.4	22.2	36.3	39.2	41.1	26 18.28	− 0.21	25.63	15 25 52.44	3.2
	*−22° 12′	47	. .	. .	. .	5.4	6.9	9.0	10.9	12.7	25.1	28.2	30.1	30 16.04	7.16	25.63	15 29 43.25	3.1
	α Serpentis	48	22.0	23.5	26.1	38.0	39.6	41.2	42.9	44.4	56.5	59.0	0.4	38 41.24	0.11	25.63	15 38 15.50	2.9
	ε Serpentis	49	50.7	52.2	54.6	6.6	8.2	9.8	11.5	13.0	24.9	27.4	29.1	45 9.82	− 0.11	25.63	15 44 44.08	2.9
	*−16° 53′	50	36.5	38.2	40.5	53.2	54.5	56.1	57.6	59.0	. .	. .	. .	48 49.45	+ 6.61	−25.63	15 48 30.43	− 3.2

CORRECTIONS, &c.

Date.	Error of Clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
June 23, 16.4	− 23.74	− 0.106	0.00	− 0.06
July 2, 17.1	− 25.66	− 0.019	+ 0.09	− 0.12

June 23. Image west 0ˢ.85; clamp east.
Image west 0ˢ.85; clamp west.

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
77.														m. s.	s.	s.	h. m. s.	s.
y 2	O. Arg. S. 15101	1	10.6	12.2	15.0	28.4	30.1	31.9	33.7	35.5	48.7	51.5	53.4	53 31.91	– 0.18	–25.64	15 53 6.09	– 3.38
Y.	γ Herculis	2	51.1	52.8	55.4	8.1	9.6	11.4	13.0	14.6	27.1	29.8	31.5	56 11.31	0.09	25.64	15 55 45.58	2.94
	B. A. C. 5357	3	56.2	58.0	1.0	16.9	19.0	21.0	23.1	25.3	40.6	44.0	46.0	2 21.01	0.24	25.64	16 1 55.13	3.80
	48 Serpentis	4	3.4	4.9	7.5	20.0	21.6	23.4	25.0	26.6	39.1	41.8	43.4	6 23.33	0.09	25.64	16 5 57.60	2.97
	Lacaille 6765	5	33.3	35.0	38.0	52.7	54.2	56.4	58.5	0.1	14.8	17.6	19.7	9 56.39	0.21	25.64	16 9 30.54	3.69
	O. Arg. S. 15615	6	50.0	52.1	53.8	55.5	58.5	. .	4.1	6.6	8.3	10.1	12.3	18 31.13	0.25	25.65	16 18 5.23	3.46
	*−23° 9′	7	20.1	22.5	25.2	. .	. .	. .	. .	. .	58.4	1.0	2.8	18 41.67	0.18	25.65	16 18 15.84	3.46
	ρ Ophiuchi	8	. .	. .	. .	38.5	40.1	41.8	43.8	45.4	. .	. .	. .	18 41.92	– 0.18	25.65	16 18 16.11	3.46
	*−33° 15′	9	35.7	37.6	40.4	54.5	56.0	58.0	0.1	2.1	. .	. .	. .	23 50.55	+ 7.54	25.65	16 23 32.44	3.75
	*−33° 13′	10	17.1	18.8	21.6	36.1	37.8	40.0	41.8	43.6	57.9	0.8	2.8	24 39.85	– 0.21	25.65	16 24 13.99	3.75
	O. Arg. S. 15782	11	7.5	9.2	12.1	25.9	27.5	29.3	31.4	33.2	47.0	49.8	51.7	31 29.51	0.19	25.65	16 31 3.67	3.69
	*−30° 13′	12	29.9	31.3	33.8	48.2	49.8	51.6	53.6	55.4	9.8	12.5	14.2	35 51.83	0.20	25.65	16 35 25.98	3.73
	B. A. C. 5622	13	40.1	41.8	44.7	58.7	0.5	2.4	4.3	6.2	20.0	22.6	24.8	41 2.37	0.20	25.65	16 40 36.52	3.78
	*−29° 8′	14	. .	. .	. .	13.6	15.4	17.4	19.3	20.9	34.6	37.5	39.2	44 24.74	– 7.60	25.65	16 43 51.47	3.75
	*−29° 8′	15	8.1	9.8	12.5	26.3	28.0	30.0	31.8	33.3	. .	. .	. .	46 22 48	+ 7.23	25.65	16 46 4.06	3.76
	*−29° 9′	16	. .	. .	. .	49.6	51.5	53.2	55.1	56.9	10.6	13.6	15.3	47 0.72	– 7.60	25.65	16 46 27 47	3.77
	O. Arg. S. 16088	17	. .	. .	. .	43.2	45.0	46.9	48.7	50.6	. .	. .	. .	47 46.88	0.18	25.65	16 47 21.05	3.77
	O. Arg. S. 16100	18	53.8	56.0	58.9	12.5	14.1	16.3	18.1	20.0	33.6	36.5	38.3	48 16.19	0.19	25.65	16 47 50.35	3.77
	κ Ophiuchi	19	0.4	1.8	4.4	16.4	18.0	19.7	21.3	22.9	35.0	37.7	39.2	52 19.71	0.10	25.66	16 51 53.95	3.11
	Weisse (2) 1735	20	23.8	25.5	28.2	41.5	43.1	45.0	46.9	48.7	1.6	4.4	6.4	57 45.01	0.08	25.66	16 57 19.27	3.05
	O. Arg. S. 16366	21	33.4	34.8	37.4	51.3	53.1	54.8	56.6	58.4	11.9	14.4	15.9	1 54.73	0.18	25.66	17 1 28.89	3 78
	Lacaille 7171	22	1.7	3.5	6.7	22.4	24.5	26.6	28.6	30.5	45.9	49.3	51.8	6 26.50	0.24	25.66	17 6 0.60	4.24
	A Ophiuchi (1st *)	23	. .	. .	. .	33.5	36.4	38.0	50.4	53.2	54.9	56.7	58.8	8 47.74	31.49	25.66	17 7 50.59	3.78
	B. A. C. 5887	24	36.1	40.3	48.9	27.0	32.1	37.9	43.0	47.7	26.1	34.2	39.5	18 37.53	0.11	25.66	17 18 11.76	3.76
	O. Arg. S. 16842	25	34.6	36.1	38.7	51.2	52.7	54.4	56.0	57.6	10.2	12.6	14.5	22 54.42	0.15	25.66	17 22 28.61	3.57
	O. Arg. S. 16856	26	. .	. .	. .	34.2	36.9	38.7	50.0	52.7	54.3	56.1	58.1	23 47.62	29.31	25.66	17 22 52.65	3.58
	*−38° 32′	27	48.1	50.5	54.7	. .	. .	. .	. .	. .	32.1	35.4	38.1	27 13.15	0.24	25.67	17 26 47.24	4.30
	B. A. C. 5932	28	10.5	12.2	15.4	30.6	32.7	35.0	37.0	38.8	53.9	57.3	59.4	28 34.80	0.23	25.67	17 28 8.90	4.31
	*−35° 8′	29	. .	. .	. .	22.9	24.6	27.0	28.8	30.9	. .	. .	. .	31 26.84	0.21	25.67	17 31 0.96	4.17
	58 Ophiuchi	30	12.7	14.2	16.9	29.8	31.4	33.2	34.9	36.5	49.5	52.1	53.7	36 33.17	0.17	25.67	17 36 7.34	3.75
	μ Herculis	31	45.9	47.7	50.4	4.0	5.7	7.6	9.3	11.2	24.6	27.6	29.3	42 7.57	0.08	25.67	17 41 41.82	3.06
	*−34° 52′	32	. .	. .	. .	. .	. .	. .	. .	. .	49.1	52.3	54.5	45 51.97	– 21.29	25.67	17 45 5.01	4.22
	*−34° 54′	33	41.4	43.6	46.5	. .	. .	. .	. .	. .	. .	. .	. .	45 43.83	+ 20.83	25.67	17 45 38.99	4.22
	*−34° 54′	34	52.9	54.5	57.6	. .	. .	. .	. .	. .	. .	. .	. .	45 55.00	20.83	25.67	17 45 50.16	4.22
	*−34° 53′	35	16.4	18.2	20.1	. .	. .	. .	. .	. .	. .	. .	. .	46 18.23	+ 20.83	25.67	17 46 13.39	4.22
	*−34° 51′	36	. .	. .	. .	27.1	28.9	30.9	32.7	34.7	. .	. .	. .	46 30.86	– 0.21	25.67	17 46 4.98	4.22
	B. A. C. 6045	37	. .	. .	. .	35.9	37.5	39.4	41.6	43.5	57.9	1.0	2.9	46 47.46	8.11	25.67	17 46 13.68	4.22
	35 Draconis	38	2.7	9.1	20.2	13.4	20.9	27.1	34.9	41.5	34.0	45.5	52.7	55 27.37	0.14	25.67	17 55 1.56	4.17
	μ Sagittarii	39	33.7	35.1	37.8	50.6	52.3	54.0	55.8	57.4	10.2	13.0	14.8	6 54.06	0.17	25.68	18 6 28.21	3.81
	*−32° 12′	40	. .	. .	. .	20.3	23.5	25.2	37.9	40.9	43.2	45.5	47.7	18 35.52	33.13	25.68	18 17 36.71	4.20
	δ Ursæ Minoris	41	. .	. .	. .	42.0	8.0	36.0	4.0	30.0	. .	. .	. .	12 36.00	0.27	25.68	. . . .	9.58
	B. A. C. 6270 (1st *)	42	25.8	27.5	30.0	. .	. .	. .	. .	. .	4.2	6.8	8.7	21 47.17	0.20	25.69	18 21 21.28	4.00
	B. A. C. 6270 (2d *)	43	. .	. .	. .	44.2	45.8	47.5	49.4	51.2	. .	. .	. .	21 47.62	0.18	25.69	18 21 21.75	4.00
	α Lyræ	44	50.7	52.5	55.9	11.1	13.1	15.2	17.2	19.1	34.6	37.7	39.9	33 15.18	0.08	25.69	18 32 49.41	3.02
4	B. A. C. 5001	45	50.6	52.3	55.3	8.9	10.8	12.6	14.5	16.4	30.2	33.0	34.6	6 12.65	– 0.18	26.39	15 5 46.08	2.76
	β Libræ	46	32.9	34.6	37.1	49.3	50.9	52.5	54.0	55.6	7.8	10.3	11.7	10 52.43	+ 0.26	26.39	15 10 26.30	2.89
	B. A. C. 5064	47	36.9	39.4	43.6	2.1	4.5	7.0	9.7	12.3	31.1	35.2	37.4	16 7.20	– 0.50	26.39	15 15 40.31	2.93
	Radcliffe 3387	48	14.6	16.9	20.2	37.2	39.2	41.4	43.7	45.7	2.7	5.9	7.8	22 41.39	– 0.38	26.40	15 22 14.61	2.88
	*−32° 46′	49	55.5	57.7	0.5	14.8	16.5	18.5	20.5	22.3	36.7	39.4	41.2	26 18.51	+ 0.55	26.40	15 25 52.66	3.31
	ζ Cor. Borealis (1st *)	50	26.1	28.5	30.7	32.9	35.8	. .	51.2	54.5	56.3	58.5	0.9	35 13.54	– 0.18	–26.40	15 34 46.96	– 2.87

July 4. **Image west $0^{r}.56$; clamp east.**
Image west $0^{r}.27$; clamp west.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 4, 17.1	– 26.44	– 0.026	– 0.59	+ 0.14

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.											Mean wire.	CORRECTIONS.		Observed Right Ascension.	Reducti to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.		Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1877. July 4 Y.	ζ Cor. Borealis (2d *)	1	49.7	51.9	55.2	10.2	12.0	14.0	16.1	18.1	33.0	36.2	38.0	35 14.04	− 0.27	−26.40	15 34 47.37	− 2.
	Lalande 28834 .	2	56.6	58.7	1.8	16.7	18.6	20.7	22.9	24.9	39.8	43.0	44.8	43 20.77	− 0.28	26.40	15 42 54.09	2.
	B. A. C. 5253 . .	3	41.5	43.2	46.0	58.9	0.7	2.6	4.3	5.8	19.0	21.8	23.4	47 2.47	+ 0.40	26.41	15 46 36.46	3.
	O. Arg. S. 15101 .	4	11.0	12.5	15.5	28.8	30.3	32.3	33.9	35.6	49.1	51.9	53.6	53 32.23	+ 0.45	26.41	15 53 6.27	3.
	ν Herculis . . .	5	51.7	53.6	56.2	8.9	10.4	12.0	13.7	15.3	27.8	30.7	32.1	56 12.04	− 0.05	26.41	15 55 45.58	2.
	B. A. C. 5357 . .	6	56.0	58.0	1.2	16.8	18.8	21.0	22.9	25.0	40.9	43.9	45.8	2 20.94	+ 0.67	26.41	16 1 55.20	3.
	δ Ophiuchi . . .	7	4.2	5.8	8.3	20.2	21.8	23.4	25.0	26.6	38.5	41.0	42.5	8 23.39	0.18	26.41	16 7 57.16	3.
	19 Scorpii	8	22.7	24.5	27.0	40.2	41.8	43.7	45.6	47.2	0.2	2.9	4.5	13 43.66	0.42	26.42	16 13 17.66	3.
	O. Arg. S. 15615 .	9	50.1	52.3	54.2	55.9	. .	. .	. .	6.6	8.4	10.0	12.3	18 31.22	0.55	26.42	16 18 5.35	3.
	ρ Ophiuchi (S.) . .	10	21.3	23.0	25.8	. .	. .	. .	. .	. .	58.6	1.3	3.0	18 42.17	0.42	26.42	16 18 16.17	3.
	ρ Ophiuchi (N.) . .	11	. .	. .	. .	38.7	40.5	42.2	44.0	45.6	. .	. .	. .	18 42.20	+ 0.40	26.42	16 18 16.18	3.
	*−5° 57′ . . .	12	. .	. .	. .	17.2	18.9	20.6	22.1	23.8	35.9	38.3	39.7	45 27.06	− 6.29	26.43	16 44 54.34	3.
	*−36° 59′ . . .	13	26.2	28.0	31.5	46.2	47.9	50.2	52.2	54.1	9.1	12.0	14.0	55 50.13	+ 0.62	26.43	16 55 24.32	4.
	B. A. C. 5774 . .	14	3.3	4.9	7.4	19.4	20.9	22.5	24.2	25.7	37.6	40.1	41.7	2 22.52	0.15	26.44	17 1 56.23	3.
	38 Ophiuchi (1st *) .	15	9.5	11.2	13.8	27.4	29.8	30.5	32.2	40.4	47.5	50.3	52.1	10 30.43	+ 0.45	26.44	17 10 4.44	3.
	*−35° 16′ . . .	16	. .	. .	. .	50.8	52.5	54.4	56.2	58.6	12.6	16.0	17.9	17 2.36	− 7.35	26.45	17 16 28.56	4.1
	*−32° 30′ . . .	17	8.0	9.9	12.3	26.7	28.3	29.8	31.6	33.5	47.5	51.4	53.2	26 30.20	+ 0.54	26.45	17 26 4.29	4.0
	*−32° 32′ . . .	18	46.8	49.0	50.8	52.5	55.4	. .	. .	. .	. .	. .	. .	25 50.90	41.10	26.45	17 26 5.55	4.0
	*−35° 8′ . . .	19	58.1	0.3	2.3	4.1	7.2	. .	21.2	25.7	28.6	30.5	33.0	31 45.10	0.68	26.45	17 31 19.33	4.1
	*−35° 8′ . . .	20	22.3	24.6	28.5	42.4	44.0	46.7	48.9	51.1	. .	. .	. .	31 38.56	8.50	26.45	17 31 20.61	4.1
	*−34° 24′ . . .	21	43.5	45.5	48.5	3.0	4.7	6.7	8.6	10.5	25.1	28.1	29.9	36 6.74	+ 0.57	26.45	14 35 40.86	4.1
	μ Herculis . . .	22	46.6	48.4	51.3	4.5	6.2	8.2	10.0	11.9	25.4	28.2	29.7	42 8.22	− 0.15	26.45	17 41 41.62	3.0
	*−34° 45′ . . .	23	38.6	40.7	43.5	. .	. .	. .	. .	. .	. .	. .	. .	45 40.93	+ 21.62	26.46	17 45 36.09	4.2
	*−34° 45′ . . .	24	. .	. .	. .	. .	. .	. .	. .	. .	20.5	23.6	25.3	46 23.13	− 19.94	26.46	17 45 36.73	4.2
	*−34° 45′ . . .	25	. .	. .	. .	59.6	1.4	3.3	5.3	7.1	. .	. .	. .	46 3.34	+ 0.58	26.46	17 45 37.46	4.2
	B. A. C. 6043 . .	26	49.5	51.4	54.5	. .	. .	. .	. .	. .	. .	. .	. .	45 51.80	+ 21.62	26.46	17 45 46.96	4.2
	*−34° 45′ . . .	27	. .	. .	. .	. .	. .	. .	. .	. .	31.4	34.3	36.3	46 34.00	− 19.94	26.46	17 45 47.60	4.2
	*−34° 45 . . .	28	. .	. .	. .	51.2	54.3	56.0	9.2	12.5	14.2	16.2	18.5	47 6.51	33.19	26.46	17 46 6.86	4.2
	*−34° 45′ . . .	29	. .	. .	. .	29.5	32.3	34.2	47.4	51.0	52.8	50.0	57.5	47 44.96	33.19	26.46	17 46 45.31	4.2
	*+51° 28′ . . .	30	13.8	16.4	19.7	. .	. .	. .	. .	. .	9.4	13.3	15.6	52 44.70	0.51	26.46	17 52 17.73	3.0
	O. Arg. N. 17693 .	31	. .	. .	. .	45.2	47.5	50.2	52.8	54.1	. .	. .	. .	52 49.96	− 0.54	26.46	17 52 22.96	3.0
	*−24° 22′ . . .	32	. .	. .	. .	46.6	48.4	50.0	51.7	53.6	. .	. .	. .	56 50.06	+ 0.41	26.46	17 56 24.01	3.9
	*−24° 22′ . . .	33	. .	. .	. .	9.4	10.7	12.4	14.1	15.8	. .	. .	. .	57 12.48	0.41	26.46	17 56 46.43	3.9
	*−24° 22′ . . .	34	. .	. .	. .	19.7	21.7	23.5	25.0	26.9	. .	. .	. .	57 23.36	0.41	26.46	17 56 57.31	3.9
	*−24° 22′ . . .	35	. .	. .	. .	35.7	37.3	39.1	41.0	42.9	. .	. .	. .	57 39.20	0.41	26.46	17 57 13.15	3.9
	*−24° 22′ . . .	36	. .	. .	. .	4.5	6.2	7.8	9.6	11.4	. .	. .	. .	58 7.90	0.41	26.46	17 57 41.85	3.9
	(* 33) Washington	37	7.5	9.0	11.8	. .	. .	. .	. .	. .	43.3	45.8	47.4	3 27.47	0.34	26.46	18 3 1.35	3.7
	*−17° 9′ . . .	38	18.3	20.5	23.4	. .	. .	. .	. .	. .	54.3	56.9	58.8	3 38.70	0.34	26.46	18 3 12.58	3.7
	μ Sagittarii . . .	39	33.8	35.5	38.2	50.9	52.6	54.4	56.2	57.9	10.4	13.2	14.9	6 54.36	+ 0.38	26.47	18 6 28.27	3.8
	δ Ursæ Minoris . .	40	. .	. .	. .	50.0	16.0	44.0	11.0	38.0	. .	. .	. .	12 43.80	− 7.72	26.47	. . . .	9.
	*−32° 12′ . . .	41	. .	. .	. .	59.2	0.8	2.4	3.8	5.4	. .	. .	. .	18 2.34	+ 0.54	26.47	18 17 36.39	4.2
	B. A. C. 6270 (1st *)	42	25.9	27.6	30.5	43.9	45.7	47.3	49.1	50.8	4.3	6.9	8.9	21 47.35	0.45	26.47	18 21 21.33	4.0
	B. A. C. 6270 (2d *)	43	5.0	7.3	9.0	11.0	13.7	. .	21.0	24.0	25.8	27.6	29.5	21 47.39	0.53	26.47	18 21 21.45	4.0
	*−36° 47′ . . .	44	58.4	0.4	2.3	3.9	7.0	. .	23.4	27.5	29.4	31.6	33.9	25 45.78	0.72	26.47	18 25 20.03	4.4
	*−36° 51′ . . .	45	25.6	27.9	30.8	. .	. .	. .	. .	. .	8.5	11.7	13.7	25 49.70	0.64	26.47	18 25 23.87	4.4
	1 Aquilæ	46	41.2	43.0	45.4	57.5	59.0	0.5	2.3	3.9	15.9	18.4	20.0	29 0.65	0.25	26.47	18 28 34.43	3.
6	α² Libræ	47	14.0	15.8	18.5	30.7	32.3	33.9	35.8	37.4	49.8	52.4	53.9	44 34.05	+ 0.32	26.98	14 44 7.39	2.7
	B. A. C. 4982 . .	48	43.5	56.7	17.3	54.5	7.5	20.2	34.0	47.4	25.5	45.9	57.1	59 20.87	− 2.68	27.00	14 58 51.19	5.6
	B. A. C. 5026 . .	49	59.8	1.9	4.9	20.4	22.3	24.5	26.5	28.5	43.8	47.0	48.8	9 24.40	0.18	27.01	15 8 57.21	2.7
	*+38° 46′ . . .	50	21.7	23.7	27.0	42.4	44.2	46.3	48.4	50.4	5.8	9.0	10.9	10 46.35	− 0.18	−27.01	15 10 19.16	− 2.7

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 6, 16.9	− 27.13	− 0.067	− 0.50	+ 0.17

server.		OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
7.															m. s.	s.	s.	h. m. s.	s.
6		B. A. C. 5069 . .	1	37.3	40.0	43.9	2.7	5.1	7.6	10.3	12.7	31.7	35.4	37.8	16 7.68	− 0.35	−27.02	15 15 40.31	− 2.83
		Weisse (2) 435. .	2	47.8	49.8	53.0	8.2	10.0	12.1	14.2	16.0	31.3	34.4	36.3	21 12.10	− 0.17	27.03	15 20 44.90	2.81
		*−23° 47′ . . .	3	. .	. .	. .	51.8	53.4	55.0	56.7	58.6	. .	. .	. .	28 55.10	+ 0.40	27.04	15 28 28.46	3.16
		*+38° 26′ . . .	4	41.2	43.5	46.5	1.7	3.7	5.8	7.9	9.9	25.0	28.2	30.2	34 5.78	− 0.18	27.04	15 33 38.56	2.84
		Lalande 28607 .	5	. .	. .	. .	55.5	56.9	58.7	0.3	2.0	. .	. .	. .	36 58.68	+ 0.26	27.04	15 36 31.90	3.04
		*−10° 25′ . . .	6	27.0	28.6	31.1	43.4	44.8	46.5	48.1	49.7	1.9	4.4	6.0	37 46.50	+ 0.27	27.04	15 37 19.73	3.04
		Lalande 28834 .	7	57.3	59.2	2.5	17.5	19.4	21.4	23.5	25.5	40.5	43.6	45.4	43 21.44	− 0.17	27.05	15 42 54.22	2.86
		B. A. C. 5253 . .	8	42.2	44.0	46.5	59.6	1.3	3.2	4.8	6.7	19.7	22.4	24.0	47 3.13	+ 0.41	27.06	15 46 36.48	3.29
	ε	Coronæ Borealis .	9	38.1	40.0	42.8	56.1	57.8	59.7	1.5	3.3	16.8	19.	21.2	52 59.71	− 0.07	27.06	15 52 32.58	2.88
		Lalande 29208 .	10	48.4	50.0	52.6	4.8	6.4	8.0	9.7	11.4	23.4	25.9	27.5	58 8.01	+ 0.28	27.07	15 57 41.22	3.16
		*−25° 59′ . . .	11	. .	. .	. .	24.8	27.6	29.3	41.3	44.2	46.0	47.8	49.9	1 38.86	− 30 44	27.07	16 0 41.35	3.42
	48	Serpentis . . .	12	4.5	6.3	8.8	21.4	22.8	24.6	26.3	28.0	40.4	43.0	44.5	6 24.60	+ 0.02	27.08	16 5 57.54	2.95
	σ	Cor. Borealis (1st *)	13	48.5	50.8	52.9	54.7	57.7	. .	10.6	13.7	15.5	17.5	19.7	10 34.16	− 0.05	27.08	16 10 7.03	2.92
	σ	Cor. Borealis (2d *)	14	11.2	13.2	16.2	30.6	32.3	34.4	36.4	38.2	52.7	55.7	57.5	10 34.40	− 0.14	27.08	16 10 7.18	2.92
		O. Arg. S. 15615 .	15	50.8	52.8	54.8	56.4	59.2	. .	4.5	7.3	9.1	10.9	13.0	18 31.88	+ 0.49	27.09	16 18 5.28	3.46
	ρ	Ophiuchi (N.*) .	16	1.5	3.8	5.5	7.3	9.9	. .	15.3	18.3	20.0	21.6	23.7	18 42.69	0.48	27.09	16 18 16.08	3.46
	ρ	Ophiuchi (S.*) .	17	21.8	23.6	26.4	. .	. .	. .	. .	. .	59.3	1.7	3.4	18 42.70	0.41	27.09	16 18 16.02	3.46
		*−23° 5′ . . .	18	. .	. .	. .	39.3	40.9	42.6	44.5	46.3	. .	. .	. .	18 42.72	0.39	27.09	16 18 16.02	3.46
		B. A. C. 5522 . .	19	19.0	20.9	23.9	37.8	39.6	41.5	43.3	45.2	59.2	2.1	3.9	25 41.49	0.50	27.10	16 25 14.89	3.71
		Lacaille 6894 . .	20	39.5	41.6	44.5	59.4	1.2	3.4	5.3	7.2	21.8	24.7	26.6	29 3.20	0.58	27.10	16 28 36.68	3.86
		*−30° 6′ . . .	21	30.3	32.2	35.0	48.7	50.6	52.3	54.1	55.9	9.9	12.6	14.6	35 52.38	0.49	27.11	16 35 25.76	3.73
		Lalande 30479 .	22	52.1	53.8	56.6	9.2	10.7	12.4	14.2	15.9	28.7	31.3	32.9	40 12.53	0.36	27.11	16 39 45.78	3.50
		*−21° 7′ . . .	23	47.4	49.0	51.8	. .	. .	. .	. .	. .	24.4	26.9	28.8	45 8.05	0.38	27.12	16 44 41.31	3.53
		O. Arg. S. 16088 .	24	25.5	27.6	30.2	44.1	45.8	47.5	49.0	50.2	5.1	7.7	9.4	47 47.46	+ 0.48	27.12	16 47 20.82	3.76
		O. Arg. S. 16100 .	25	. .	. .	. .	34.3	37.1	39.0	51.4	54.3	56.0	58.1	0.2	48 48.80	− 31.28	27.12	16 47 50.40	3.76
		*−36° 59′ . . .	26	17.1	19.2	22.2	. .	. .	. .	. .	. .	0.3	2.8	4.7	55 41.05	+ 0.61	27.13	16 55 14.53	4.07
		*−36° 59′ . . .	27	26.8	28.8	32.1	. .	. .	. .	. .	. .	10.0	13.0	14.9	55 50.93	+ 0.61	27.13	16 55 24.41	4.07
	ε	Ursæ Minoris. .	28	. .	. .	. .	50.0	1.0	13.3	25.5	36.8	. .	. .	. .	59 13.32	− 2.48	27.14	16 58 43 70	5.46
		*−35° 10 . . .	29	. .	. .	. .	4.8	6.8	8.6	10.4	12.3	27.4	30.3	32.0	6 16.58	− 7.37	27.14	17 5 42.07	4.07
		*−27° 48′ . . .	30	33.6	35.3	38.1	52.0	53.5	55.5	57.2	58.7	12.5	15.1	16.9	12 55.31	+ 0.46	27.15	17 12 28.62	3.86
		*−35° 16′ . . .	31	31.3	33.9	36.8	. .	. .	. .	. .	. .	13.6	17.0	18.8	16 55.23	0.56	27.15	17 16 28.64	4.12
		Ophiuchi . . .	32	24.1	25.9	28.4	40.6	42.1	43.8	45.5	47.0	59.4	1.7	3.4	29 43.81	+ 0.06	27.17	17 29 16.70	3.19
		*−32° 6 . . .	33	. .	. .	. .	55.0	56.5	58.3	0.3	2.3	16.5	18.8	20.8	31 6.06	− 7.13	27.17	17 30 31.76	4.08
		*−34° 51′ . . .	34	22.6	24.4	27.0	41.8	43.8	45.8	47.7	49.5	4.5	7.2	9.0	44 45.75	+ 0.56	27.18	17 44 19.13	4 24
		*−34° 51′ . . .	35	18.5	20.6	23.4	38.0	39.8	41.8	43.8	45.8	0.4	3.4	5.0	45 41.87	0.56	27.18	17 45 15.24	4.21
		*−34° 51′ . . .	36	29.9	31.7	34.8	49.3	51.3	53.3	55.2	57.1	11.9	14.6	16.4	45 53.23	+ 0.56	27.19	17 45 26.60	4.24
		*−34° 51′ . . .	37	. .	. .	. .	. .	. .	. .	. .	. .	20.7	23.6	25.4	46 23.23	− 20.47	27.19	17 45 35.57	4.25
		*−34° 51′ . . .	38	. .	. .	. .	. .	. .	. .	. .	. .	35.0	37.8	39.8	46 37.53	20.47	27.19	17 45 49.87	4.25
		*−34° 51′ . . .	39	. .	. .	. .	. .	. .	. .	. .	. .	49.8	52.8	54.5	46 52.37	20.47	27.19	17 46 4.71	4.25
		B. A. C. 6045 . .	40	. .	. .	. .	. .	. .	. .	. .	. .	58.9	1.9	3.7	47 1.50	20.47	27.19	17 46 13.84	4.25
		*−34° 51′ . . .	41	. .	. .	. .	. .	. .	. .	. .	. .	14.0	17.0	18.7	47 16.57	− 20.47	27.19	17 46 28.91	4.25
		*−28° 5′ . . .	42	11.3	13.4	15.3	17.1	20.1	. .	18.4	21.1	22.8	24.7	26.9	50 49.11	+ 0.54	27.19	17 50 22.46	4.05
		*−28° 4′ . . .	43	31.6	33.4	36.3	49.8	51.5	53.4	55.2	57.1	10.6	13.4	15.0	50 53.39	0.46	27.19	17 50 26.66	4.05
		*−36° 18′ . . .	44	19.0	21.0	24.2	38.9	40.8	42.8	44.8	46.6	1.6	4.6	6.2	55 42.77	+ 0.58	27.20	17 55 16 15	4.34
		*−36° 18′ . . .	45	. .	. .	. .	14.6	16.5	18.5	20.4	22.5	37.2	40.3	41.9	56 26.49	− 7.46	27.20	17 55 51.83	4.35
		O. Arg. S. 77648 .	46	8.6	10.2	12.8	25.6	27.2	29.0	30.7	32.3	45.1	47.8	49.4	0 28.97	+ 0.39	27.20	18 0 2.16	3.83
	μ	Sagittarii . . .	47	34.6	36.3	38.9	51.7	53.3	55.0	56.7	58.3	11.4	14.0	15.5	6 55.06	+ 0.39	27.21	18 6 28.24	3.81
	δ	Ursæ Minoris. .	48	. .	. .	. .	49.0	14.0	42.0	10.0	37.0	. .	. .	. .	12 42.40	− 5.71	27.22	. . . .	9.08
		*−32° 12′ . . .	49	17.6	19.4	22.4	. .	. .	. .	. .	. .	58.2	1.1	3.2	17 40.32	+ 0.53	27.22	18 17 13.63	4.24
		*−32° 11′ . . .	50	. .	. .	. .	21.1	23.8	25.8	38.6	41.7	43.5	45.6	47.8	18 35.99	− 32.28	−27.22	18 17 36.49	− 4.24

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 6, 16.9	− 27.13	− 0.067	− 0.50	+ 0.17

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductio to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1877. July 6 Y.	B. A. C. 6270 (1st *)	1	5.7	7.8	9.8	11.6	14.5	21.9	24.9	26.5	28.4	30.5	. .	21 48.16	+ 0.52	−27.23	18 21 21.45	− 4.
	B. A. C. 6270 (2d *)	2	26.7	28.5	31.2	44.7	46.4	48.0	50.0	51.5	5.0	7.7	9.6	21 48.12	0.44	27.23	18 21 21.33	4.
	*−36° 47′ . . .	3	3.0	5.5	7.8	9.5	12.4	. .	28.3	31.3	33.1	35.3	37.5	25 50.37	0.69	27.23	18 25 23.83	4.
	*−36° 50′ . . .	4	22.7	25.0	28.2	42.9	45.1	47.1	49.0	51.1	5.3	8.5	10.6	25 46.86	0.60	27.23	18 25 20.23	4.
	1 Aquilæ. . . .	5	41.9	43.6	46.2	58.2	59.7	1.3	3.0	4.6	16.6	19.2	20.7	29 1.36	0.24	27.24	18 28 34.36	3.
7	B. A. C. 4982 . .	6	37.8	51.3	12.0	49.4	2.2	15.4	30.0	42.8	20.8	40.0	53.0	59 15.88	2.71	28.48	14 58 50.11	5.
	β Libræ	7	35.2	36.7	39.3	51.4	52.9	54.6	56.2	57.8	10.0	12.5	13.9	10 54.59	0.18	28.49	15 10 26.28	2.
	*+41° 36′ . . .	8	5.7	. .	11.1	27.0	28.7	31.1	33.5	35.5	51.4	. .	56.9	16 31.21	0.38	28.49	15 16 3.10	2.
	Weisse (2) 435. .	9	48.6	50.9	53.9	9.0	11.0	13.1	15.0	17.1	32.3	35.2	37.1	21 13.02	0.35	28.50	15 20 44.87	2.
	*+43° 14′ . . .	10	58.1	0.2	3.6	20.2	21.1	24.2	26.4	28.6	45.0	48.3	50.4	34 24.19	0.40	28.51	15 33 56.08	2.
	ε Serpentis . . .	11	53.0	54.6	57.2	9.2	10.6	12.3	14.0	15.4	27.6	30.1	31.6	45 12.33	0.21	28.51	15 44 44.03	2.9
	*−16° 53′ . . .	12	39.0	40.5	42.9	55.5	57.0	58.7	0.7	2.4	14.8	17.2	18.7	48 58.86	0.17	28.52	15 48 30.51	3.1
	49 Libræ	13	37.1	38.8	41.4	53.8	55.3	57.0	58.7	0.3	12.9	15.5	17.0	53 57.07	0.17	28.52	15 53 28.72	3.2
	Lalande 29341 .	14	41.3	43.1	46.3	0.5	2.4	4.4	6.5	8.5	22.9	25.9	27.6	0 4.49	0.33	28.52	15 59 36.30	2.8
	48 Serpentis . . .	15	5.9	7.6	10.2	22.5	24.2	25.9	27.6	29.1	41.7	44.4	45.9	6 25.91	0.25	28.53	16 5 57.63	2.9
	*−32° 12′ . . .	16	43.7	45.4	48.1	. .	. .	. .	. .	. .	23.7	26.5	28.1	14 5.92	+ 0.16	28.53	16 13 37.55	3.6
	*−32° 11′ . . .	17	. .	. .	. .	50.6	53.5	55.3	8.3	11.3	13.0	15.0	17.4	15 5.55	− 32.65	28.53	16 14 4.37	3.6
	ν Coronæ Borealis .	18	. .	. .	. .	10.6	12.4	14.5	16.4	18.4	32.8	35.8	37.7	18 22.33	− 7.49	28.54	16 17 46.30	2.9
	Weisse 439 . .	19	37.7	39.2	41.9	53.8	55.4	57.0	58.6	0.1	12.2	14.5	16.1	24 56.95	+ 0.21	28.54	16 24 28.62	3.0
	ζ Ophiuchi . . .	20	35.4	37.0	39.6	51.7	53.2	54.9	56.4	58.2	10.4	12.9	14.3	30 54.91	0.18	28.54	16 30 26.55	3.2
	*−39° 16′ . . .	21	45.5	47.6	50.6	6.1	7.9	9.9	12.3	14.3	29.6	32.8	34.9	35 10.14	0.15	28.55	16 34 41.74	4.0
	B. A. C. 5619 . .	22	27.4	29.3	32.3	46.8	48.6	50.6	52.6	54.5	9.0	11.8	13.6	39 50.59	0.33	28.55	16 39 22.37	2.97
	*−21° 9′ . . .	23	. .	. .	. .	6.3	7.8	9.6	11.3	13.1	. .	. .	. .	45 9.62	+ 0.15	28.55	16 44 41.22	3.56
	28 Ophiuchi . . .	24	. .	. .	. .	56.5	57.1	58.7	0.5	2.2	15.7	18.3	20.0	57 6.00	− 7.02	28.56	16 56 30.42	3.71
	31 Ophiuchi . . .	25	. .	. .	. .	38.2	39.9	41.6	43.5	45.3	58.5	1.2	3.9	57 49.01	− 7.01	28.56	16 57 13.44	3.7
	B. A. C. 5818 . .	26	50.9	53.2	55.3	56.9	59.8	. .	9.3	12.5	14.2	16.1	18.3	9 34.65	+ 0.24	28.57	17 9 6.32	3.44
	*−30° 12′ . . .	27	18.0	20.0	22.9	36.6	38.3	40.3	42.2	43.7	57.6	0.7	2.3	9 40.24	0.16	28.57	17 9 11.83	3.44
	*+35° 20′ . . .	28	56.4	58.4	1.4	16.1	17.9	20.0	21.9	24.0	38.5	41.5	43.4	17 19.95	0.34	28.58	17 16 51.71	3.0
	*−17° 43′ . . .	29	4 .0	45.0	47.5	59.9	1.3	2.9	4.6	6.7	18.7	21.2	22.6	23 3.04	0.17	28.58	17 22 34.63	3.6
	O. Arg. S. 16847 .	30	23.6	25.2	27.1	28.9	31.4	. .	. .	. .	. .	. .	. .	22 27.24	+ 36.08	28.58	17 22 34.74	3.6
	O. Arg. S. 16854 .	3	. .	. .	. .	36.5	39.0	40.5	52.0	54.8	56.4	58.1	0.0	23 49.66	− 28.97	28.58	17 22 52.11	3.6
	O. Arg. S. 16952 .	32	33.7	35.4	38.2	50.6	52.1	53.8	55.7	57.3	9.8	12.4	14.0	27 53.91	+ 0.17	28.58	17 27 25.50	3.6
	*−20° 35′ . . .	33	23.0	24.8	27.4	40.1	41.8	43.5	45.3	46.8	. .	. .	. .	30 36.59	+ 7.08	28.58	17 30 15.09	3.7
	*−20° 34′ . . .	34	. .	. .	. .	59.6	0.1	3.0	4.8	6.5	19.5	22.4	24.5	31 10.05	− 6.75	28.58	17 30 34.72	3.7
	*−34° 24′ . . .	3	46.2	47.9	50.9	5.5	7.2	9.1	11.2	13.0	27.6	30.6	32.5	36 9.25	+ 0.15	28.59	17 35 40.81	4.1
	*−34° 42′ . . .	36	19.4	21.2	24.3	38.9	40.7	42.6	44.7	46.7	1.2	4.0	5.9	39 42.69	0.15	28.59	17 39 14.25	4.2
	*−34° 48′ . . .	37	2.1	3.8	6.5	. .	. .	. .	. .	. .	. .	. .	. .	44 4.13	21.19	28.59	17 43 56.73	4.2
	*−34° 48′ . . .	38	. .	. .	. .	25.4	27.8	30.1	32.1	34.1	. .	. .	. .	44 29.90	0.14	28.59	17 44 1.45	4.2
	*−34° 48′ . . .	39	. .	. .	. .	43.8	45.8	47.8	49.6	51.6	. .	. .	. .	44 47.72	0.14	28.59	17 44 19.27	4.
	*−34° 48′ . . .	40	. .	. .	. .	57.2	59.0	1.2	3.3	5.0	. .	. .	. .	45 1.14	0.14	28.59	17 44 32.69	4.
	*−34° 48′ . . .	41	20.3	22.2	25.3	. .	. .	. .	. .	. .	. .	. .	. .	45 22.60	21.19	28.59	17 45 15.20	4.
	*−34° 48′ . . .	42	31.7	33.6	36.3	. .	. .	. .	. .	. .	. .	. .	. .	45 33.87	21.19	28.59	17 45 26.47	4.
	*−34° 48′ . . .	43	40.9	43.0	45.7	. .	. .	. .	. .	. .	. .	. .	. .	45 43.20	21.19	28.59	17 45 35.80	4.
	*−34° 48′ . . .	44	54.9	56.7	59.8	. .	. .	. .	. .	. .	. .	. .	. .	45 57.13	21.19	28.59	17 45 49.73	4.
	*−34° 48′ . . .	45	9.8	11.9	14.8	. .	. .	. .	. .	. .	. .	. .	. .	46 12.17	21.19	28.59	17 46 4.77	4.
	B. A. C. 6045 . .	46	18.8	20.9	23.8	38.4	40.3	42.2	44.2	46.1	0.7	3.8	5.5	46 42.25	0.15	28.59	17 46 13.81	4.
	*+36° 18′ . . .	47	32.3	34.4	37.4	52.2	54.2	56.2	58.2	0.2	14.9	17.8	19.8	54 56.15	0.35	28.60	17 54 27.90	3.
	Weisse 1174 . .	48	28.1	29.7	32.4	44.2	45.7	47.4	49.1	50.6	2.6	5.1	6.5	57 47.40	0 21	28.60	17 57 19.01	3.
	(* 33) Washington	49	9.8	11.4	14.2	26.5	28.3	29.9	31.5	33.1	. .	. .	. .	3 23.09	+ 6.95	28.61	18 3 1.43	3.
	*−17° 12′ . . .	50	. .	. .	. .	57.4	0.1	1.7	13.0	15.8	17.3	19.9	22.1	4 10.91	− 28.89	−28.61	18 3 13.41	− 3.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 7, 16.9	− 28.56	− 0.040	+ 0.13	+ 0.20

served.	OBJECT.	Number.	I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
7.														m. s.	s.	s.	h. m. s.	s.
7	μ Sagittarii . . .	1	36.3	37.9	40.5	53.3	55.0	56.7	58.6	0.2	13.0	15.7	17.3	6 56.77	+ 0.16	−28.61	18 6 28.32	− 3.85
.	*−21° 5′ . . .	2	19.7	21.6	23.2	25.0	27.9	. .	32.2	35.0	36.6	38.3	40.5	7 00.00	0.24	28.61	18 6 31.63	3.85
	δ Ursæ Minoris. .	3	. .	. .	. .	39.0	4.0	32.0	1.0	27.0	. .	. .	. .	12 32.60	+ 5.47	28.61	. . . . .	8.90
	*−32° 25′ . . .	4	. .	. .	. .	7.4	8.8	10.7	12.7	14.8	27.8	30.2	31.9	17 18.04	− 7.52	28.62	18 16 41.90	4.25
	B. A. C. 6261 . .	5	14.6	16.5	19.3	32.6	34.2	36.2	37.8	39.7	53.1	55.7	57.5	20 36.11	+ 0.16	28.62	18 20 7.65	4.05
	*−36° 50′ . . .	6	1.9	4.3	6.4	8.1	10.7	. .	26.4	30.0	32.0	34.0	36.3	25 49.01	0.24	28.62	18 25 20.63	4.47
	*−36° 47′ . . .	7	28.5	30.6	33.6	48.6	50.4	52.5	54.6	56.5	11.5	14.7	16.5	25 52.55	0.15	28.62	18 25 24.08	4.47
	(* 35) Washington	8	41.0	42.8	45.3	58.0	59.5	1.2	3.2	4.7	17.4	19.8	21.5	32 1.31	0.17	28.63	18 31 32.85	3.83
	*−1° 6′ . . .	9	59.9	1.5	4.0	15.9	17.4	19.0	20.6	22.2	34.2	36.6	38.1	36 19.04	0.20	28.63	18 35 50.61	3.45
	Weisse 887 . .	10	4.9	6.5	9.0	. .	. .	. .	. .	. .	39.4	41.8	43.2	37 24.13	0.21	28.63	18 36 55.71	3.45
	*−1° 6′ . . .	11	12.9	14.4	16.6	. .	. .	. .	. .	. .	47.0	49.5	51.1	37 31.92	0.21	28.63	18 37 3.50	3.15
	Lalande 34950 .	12	10.8	12.7	15.9	30.4	32.5	34.6	36.7	38.6	53.2	56.1	57.9	41 34.49	0.35	28.63	18 41 6.21	3.03
	β¹ Lyræ	13	40.8	42.7	45.8	59.7	1.5	3.6	5.7	7.6	21.7	24.6	26.3	46 3.64	0.33	28.63	18 45 35.34	3.05
	β² Lyræ	14	20.4	22.7	24.7	26.6	29.4	. .	41.4	44.6	46.4	48.3	50.6	46 5.51	+ 0.42	28.63	18 45 37.30	3.05
25	β¹ Scorpii. . . .	15	40.9	42.6	45.2	57.8	59.5	1.2	3.0	4.6	17.4	20.0	21.7	59 1.26	− 0.36	40.59	15 58 20.31	3.16
	σ Cor. Borealis (S.).	16	2.3	4.5	6.5	8.4	11.6	. .	24.2	27.2	29.1	31.2	33.6	10 47.86	0.21	40.60	16 10 7.05	2.69
	σ Cor. Borealis (N.).	17	24.8	26.5	29.5	44.0	45.8	47.9	49.8	51.6	6.0	8.9	11.0	10 47.80	0.12	40.60	16 10 7.08	2.69
	O. Arg. S. 15615 .	18	5.2	7.1	8.9	10.6	. .	. .	. .	21.4	23.2	25.2	27.4	18 46.13	0.46	40.61	16 18 5.06	3.36
	*−23° 9′ . . .	19	36.2	37.7	40.2	. .	. .	. .	. .	. .	13.1	16.0	18.0	18 56.87	0.40	40.61	16 18 15.86	3.36
	*−23° 9′ . . .	20	15.8	17.9	19.7	21.4	29.5	. .	29.8	32.4	34.1	36.0	38.1	18 56.97	0.47	40.61	16 18 15.89	3.36
	*−23° 7′ . . .	21	. .	. .	. .	53.4	54.9	56.8	58.6	0.2	. .	. .	. .	18 56.78	0.38	40.61	16 18 15.79	3.36
	B. A. C. 5522 . .	22	33.3	35.0	37.9	51.9	53.8	55.7	57.6	59.3	13.4	16.3	18.3	25 55.68	0.46	40.62	16 25 14.60	3.60
	O. Arg. S. 15787 .	23	22.7	24.2	27.1	41.0	42.7	44.6	46.4	48.3	1.9	4.6	6.7	31 44.56	0.44	40.63	16 31 3.49	3.59
	*−30° 8′ . . .	24	44.3	45.9	48.8	2.7	4.6	6.5	8.9	10.8	24.0	26.9	28.9	36 6.57	0.45	40.64	16 35 25.48	3.65
	*−38° 13′ . . .	25	4.8	6.5	9.7	24.9	26.9	28.9	31.1	33.0	48.3	51.4	53.6	47 29.01	0.53	40.65	16 46 47.83	3.98
	*−30° 1′ . . .	26	39.9	41.6	44.4	58.5	0.4	2.3	4.3	5.8	29.6	22.2	24.4	51 2.13	0.45	40.66	16 50 21.02	3.75
	28 Ophiuchi . . .	27	. .	. .	. .	7.9	9.4	11.3	13.2	14.8	. .	. .	. .	57 11.32	0.40	40.67	16 56 30.25	3.71
	α¹ Herculis . . .	28	26.6	28.0	30.6	42.9	44.6	46.3	48.0	49.6	1.8	4.4	6.1	9 46.26	0.19	40.69	17 9 5.38	3.04
	*+35° 20′ . . .	29	53.2	55.0	57.8	. .	. .	. .	. .	. .	35.0	38.3	40.0	16 16.55	0.13	40.70	17 15 35.72	2.87
	*+35° 19′ . . .	30	9.0	10.8	13.9	28.6	30.5	32.5	34.5	36.4	51.0	54.0	56.0	17 32.47	0.12	40.70	17 16 51.65	2.87
	*−17° 41′ . . .	31	36.2	37.9	39.7	41.3	43.9	. .	47.4	50.1	51.7	53.3	55.2	23 15.67	0.42	40.70	17 22 34.55	3.62
	*−17° 41′ . . .	32	55.6	57.3	59.9	12.4	13.8	15.7	17.4	19.0	21.6	24.2	25.8	23 15.70	0.35	40.70	17 22 34.65	3.62
	O. Arg. S. 16952 .	33	46.4	48.0	50.5	3.2	4.7	6.5	8.2	9.8	22.4	25.0	26.8	28 6.50	0.35	40.71	17 27 25.44	3.65
	58 Ophiuchi . . .	34	27.9	29.3	32.1	44.9	46.6	48.3	50.1	51.7	4.6	7.3	8.9	36 48.34	0.37	40.72	17 36 7.25	3.79
	μ Herculis . . .	35	1.0	2.7	5.5	19.0	20.7	22.6	24.5	26.1	39.7	42.5	44.2	42 22.59	0.14	40.73	17 41 41.72	2.99
	*−34° 45′ . . .	36	4.2	6.0	8.9	14.7	16.6	18.7	20.8	22.7	. .	. .	. .	46 18.70	0.49	40.74	17 45 37.47	4.27
	*−34° 45′ . . .	37	. .	. .	. .	. .	. .	. .	. .	. .	35.5	38.7	40.6	46 22.32	0.51	40.74	17 45 41.07	4.27
	*−34° 43′ . . .	38	. .	. .	. .	46.2	49.2	51.2	4.7	7.9	9.8	11.8	14.0	47 2.47	34.39	40.74	17 45 47.34	4.27
	*−34° 47′ . . .	39	. .	. .	. .	. .	. .	. .	23.1	25.9	27.8	30.1	32.5	47 27.88	42.14	40.74	17 46 5.00	4.27
	*+51° 30′ . . .	40	28.1	29.7	34.4	. .	. .	. .	. .	. .	22.7	27.3	29.8	52 58.67	0.07	40.74	17 52 17.86	2.85
	O. Arg. N. 17663 .	41	. .	. .	. .	58.8	1.0	3.8	6.5	9.0	. .	. .	. .	53 3.82	− 0.04	40.74	17 52 23.04	2.85
	ψ² Draconis . . .	42	1.1	6.1	13.8	52.7	57.6	3.0	8.5	13.0	52.0	59.9	5.5	58 3.02	+ 0.02	40.75	17 57 22.29	2.91
	*−20° 24′ . . .	43	54.8	56.3	58.8	11.9	13.4	15.1	17.0	18.6	31.3	34.0	35.7	5 15.17	− 0.37	40.76	18 4 34.04	3.88
	* −20° 21′ . . .	44	2.5	4.0	6.8	. .	. .	. .	. .	. .	38.9	41.6	43.3	5 22.85	− 0.38	40.76	18 4 41.71	3.88
	δ Ursæ Minoris. .	45	. .	. .	. .	51.0	18.0	46.0	14.0	40.0	. .	. .	. .	12 45.80	+ 0.46	40.77	. . . . .	. .
	B. A. C. 6261 . .	46	. .	. .	. .	45.4	47.0	48.7	50.7	52.3	5.8	8.6	10.4	20 56.11	− 7.66	40.78	18 20 7.67	4.13
	B. A. C. 6270 (1st *)	47	41.2	42.8	45.5	58.9	0.6	2.5	4.4	6.2	. .	. .	. .	21 55.26	+ 6.83	40.79	18 21 21 30	4.13
	B. A. C. 6270 (2d *)	48	20.1	22.3	24.1	25.8	28.8	. .	36.5	39.3	41.2	42.9	45.0	22 2.60	− 0.50	40.79	18 21 21.31	4.13
	Lalande 34222 .	49	30.5	32.0	34.4	47.7	49.3	51.0	52.8	54.5	7.5	10.2	11.9	25 51.08	0.38	40.79	18 25 9.91	4.01
	1 Aquilæ. . . .	50	56.4	57.9	0.2	12.3	13.8	15.5	17.1	13.7	30.6	33.2	34.9	29 15.51	− 0.29	−40.80	18 28 34.42	− 3.66

July 11. **Image west $0^r.10$; clamp west.**
Image west $0^r.64$; clamp east.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 25, 17.7	− 40.73	− 0.085	+ 0.27	− 0.25

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reducti to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1877. July 25 Y.	B. A. C. 6375	1	57.4	3.8	15.4	10.2	17.4	25.0	32.5	39.5	34.5	45.8	54.0	36 25.05	+ 0.01	−40.81	18 35 44.25	— 3.
	*+36° 28′	2	. .	. .	. .	20.0	23.0	25.1	38.9	42.0	43.9	46.0	48.5	40 35.93	— 34.74	40.81	18 40 20.38	3.
	Lalande 34950	3	23.6	25.4	28.4	43.2	45.1	47.3	49.3	51.1	6.0	9.0	11.1	41 47.23	0.11	40.81	18 41 6.31	3.
	*−33° 25′	4	53.3	55.5	57.7	59.4	2.4	. .	14.9	17.7	19.6	21.6	23.9	49 8.60	0.57	40.82	18 48 27.21	4.
	*−33° 24′	5	16.4	17.9	20.9	35.5	37.1	39.2	41.2	42.9	57.2	0.1	2.0	49 39.13	0.48	40.82	18 48 57.83	4.
	*−15° 2′	6	27.7	29.2	31.8	44.3	45.8	47.5	49.2	50.8	3.1	5.7	7.5	56 47.51	0.33	40.83	18 56 6.35	3.
	O. Arg. S. 19104	7	14.9	15.6	19.3	32.0	33.7	35.5	37.2	38.8	51.8	54.5	56.2	1 35.41	0.38	40.84	19 0 54.19	4.
	Lalande 36002	8	44.7	46.5	49.7	5.0	6.9	8.9	11.0	13.0	28.3	31.3	33.4	5 8.97	0.11	40.85	19 4 28.01	3.
	*−19° 18′	9	. .	. .	. .	26.4	27.8	29.7	31.6	33.3	46.2	48.3	50.0	10 36.68	7.22	40.85	19 9 48.61	4.
	*− 8° 25′	10	29.7	31.2	33.7	. .	. .	. .	. .	. .	4.4	6.8	8.4	17 49.03	0.30	40.87	19 17 7.86	3.7
	*− 8° 25′	11	36.7	38.2	40.8	. .	. .	. .	. .	. .	11.1	13.7	15.5	17 56.00	0.30	40.87	19 17 14.83	3.7
	δ Aquilæ	12	43.2	44.7	47.1	59.2	0.7	2.4	3.9	5.5	17.5	20.0	21.6	20 2.35	0.24	40.87	19 19 21.24	3.5
26	β¹ Scorpii	13	42.0	43.6	46.1	58.9	0.5	2.3	4.0	5.7	18.3	21.0	22.7	59 2.28	0.33	41.68	15 58 20.27	3.1
	σ Cor. Borealis (S.)	14	25.7	27.5	30.5	44.9	46.7	48.8	50.7	52.6	7.0	10.0	12.0	10 48.76	0.18	41.69	16 10 6.89	2.6
	σ Cor. Borealis (N.)	15	3.3	5.3	7.6	9.5	12.7	. .	25.5	28.3	30.2	32.4	34.6	10 48.94	— 0.27	41.69	16 10 6.98	2.6
	O. Arg. S. 15615	16	6.2	8.1	9.9	11.7	14.4	. .	. .	. .	. .	. .	. .	18 10.06	+ 36.69	41.70	16 18 5.05	3.3
	*− 23° 8′	17	37.1	38.7	41.4	. .	. .	. .	. .	. .	. .	. .	. .	18 39.07	+ 18.42	41.70	16 18 15.79	3.3
	*−23° 7′	18	. .	. .	. .	54.3	56.2	57.9	59.6	1.5	. .	. .	. .	18 57.90	— 0.34	41.70	16 18 15.86	3.3
	*−23° 8′	19	. .	. .	. .	14.2	17.0	18.7	30.8	33.5	35.2	37.0	39.2	19 28.20	30.64	41.70	16 18 15.86	3.3
	B. A. C. 5522	20	34.6	36.3	39.1	53.2	54.9	56.9	58.8	0.7	14.5	17.5	19.2	25 56.88	0.40	41.70	16 25 14.78	3.5
	O. Arg. S. 15782	21	23.7	25.5	28.3	41.8	43.5	45.7	47.6	49.6	3.1	6.0	7.7	31 45.68	0.39	41.71	16 31 3.58	3.5
	*−29° 8′	22	. .	. .	. .	50.9	53.8	55.7	8.2	10.8	12.8	14.7	16.9	45 5.47	32.28	41.72	16 43 51.47	3.6
	*−29° 4′	23	23.9	26.1	28.7	42.3	44.0	46.2	48.1	49.6	3.4	6.3	8.2	46 46.07	0.39	41.72	16 46 3.96	3.6
	*−29° 4′	24	. .	. .	. .	26.7	29.5	31.5	44.2	47.0	48.8	50.7	52.8	47 41.40	32.26	41.72	16 46 27.42	3.6
	*−29° 58′	25	41.6	43.5	46.0	0.1	2.1	. .	5.9	7.9	21.2	24.5	26.8	51 3.96	0.39	41.72	16 50 21.85	3.7
	31 Ophiuchi	26	34.2	36.0	38.6	51.8	53.4	55.4	57.0	58.8	11.9	14.8	16.7	57 55.33	0.34	41.73	16 57 13.26	3.6
	O. Arg. S. 16298	27	. .	. .	. .	51.4	54.3	56.2	8.3	10.9	12.8	14.6	16.7	59 5.65	31.14	41.73	16 57 52.78	3.6
	B. A. C. 5774	28	19.2	20.7	23.1	35.0	36.5	38.1	39.8	41.2	53.2	55.7	57.4	2 38.17	0.25	41.73	17 1 56.19	3.2
	a¹ Herculis	29	27.7	29.2	31.7	44.1	45.7	47.4	49.1	50.7	2.9	5.5	7.0	9 47.36	0.21	41.74	17 9 5.41	3.0
	B. A. C. 5887	30	. .	. .	. .	42.4	47.5	52.9	58.0	3.8	. .	. .	. .	18 52.92	0.30	41.74	17 18 10.88	2.7
	O. Arg. N. 17413	31	1.3	5.4	11.8	. .	. .	. .	. .	. .	34.3	41.2	45.6	37 53.27	0.24	41.76	17 37 11.27	2.7
	*+68° 28′	32	. .	. .	. .	53.6	57.7	2.2	6.6	10.7	. .	. .	. .	38 2.16	0.19	41.76	17 37 20.21	2.7
	Weisse (2) 1394	33	0.7	2.6	5.4	20.4	22.3	24.4	26.5	28.4	43.0	46.1	48.2	44 24.36	0.18	41.77	17 43 42.41	2.9
	Weisse (2) 1398	34	43.5	45.7	47.7	49.7	52.9	. .	7.7	10.7	12.7	14.8	17.2	44 30.26	0.27	41.77	17 43 48.22	2.9
	*−36° 58′	35	56.7	58.4	1.5	16.5	18.6	20.7	22.7	24.6	39.5	42.8	44.7	48 20.61	0.45	41.77	17 47 38.39	4.3
	*+51° 30′	36	29.1	31.5	35.5	. .	. .	. .	. .	. .	24.1	28.2	30.7	52 59.85	0.18	41.77	17 52 17.90	2.8
	O. Arg. N. 17663	37	. .	. .	. .	59.7	2.2	5 0	7.7	9.8	. .	. .	. .	53 4.88	0.19	41.77	17 52 22.92	2.8
	35 Draconis	38	. .	. .	. .	27.4	34.6	41.7	49.3	56.1	. .	. .	. .	55 41.82	0.29	41.77	17 54 59.76	2.9
	O. Arg. S. 17648	39	23.9	25.4	28.1	40.8	42.4	44.3	46.0	47.7	0.4	3.2	4.9	0 44.28	0.34	41.78	18 0 2.16	3.8
	*−28° 16′	40	37.0	38.8	41.6	55.3	56.8	58.8	0.5	2.2	15.9	18.7	20.4	3 58.73	0.38	41.78	18 3 16.57	4.1
	*+37° 41′	41	50.5	52.3	55.4	10.5	12.5	14.6	16.6	18.5	33.6	36.8	38.8	8 14.55	0.18	41.78	18 7 32.59	2.9
	B. A. C. 6212	42	42.2	44.0	46.8	1.0	2.9	4.8	6.9	8.7	22.7	25.7	27.6	14 4.85	0.41	41.78	18 13 22.66	4.3
	δ Ursæ Minoris	43	. .	. .	. .	. .	. .	. .	. .	. .	3.0	45.0	13.0	17 40.33	4 53.33	41.79	. . . .	4.7
	ι Aquilæ	44	57.3	58.7	1.2	13.5	14.9	16.6	18.3	19.7	31.8	34.3	36.0	29 16.57	0.28	41.80	18 28 34.49	3.6
	β¹ Lyræ	45	54.5	56.4	59.3	13.6	15.5	17.4	19 4	21.2	35.4	38.4	40.4	46 17.40	0.18	41.81	18 45 35.41	3.0
	*−33° 25′	46	. .	. .	. .	38.0	39.9	41.8	43 7	45.6	. .	. .	. .	48 41.80	0.41	41.81	18 47 59.58	4.4
	*−33° 25′	47	. .	. .	. .	58.8	0.6	2.7	4.5	6.6	20.7	23.7	25.6	49 10.40	8.17	41.81	18 48 20.42	4.4
	Lacaille 7926	48	. .	. .	. .	35.5	37.5	39.6	41.5	43.2	. .	. .	. .	49 39.46	0.41	41.81	18 48 57.24	4.5
	*−33° 29′	49	. .	. .	. .	58.1	0.0	3.3	15.7	19.4	21.2	23.4	25.6	50 13.34	33.81	41.81	18 48 57.72	4.5
	*−15° 4′	50	. .	. .	. .	45.3	46.7	48.5	50.3	51.9	4.2	6.9	8.5	56 55.29	— 7.00	−41.82	18 56 6.47	— 3.8

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 26, 18.3	− 41.79	− 0.046	+ 0.18	− 0.25

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
77.														m. s.	s.	s.	h. m. s.	s.
y 26	O. Arg. S. 19104 .	1	16.1	17.5	20.3	33.1	34.7	36.6	38.3	39.8	52.8	55.5	57.2	1 36.54	− 0.34	−41.82	19 0 54.38	− 4.10
Y.	*−19° 18′ . . .	2	10.7	12.9	15.3	27.5	29.1	. .	32.5	34.1	46.8	49.6	51.5	10 31.00	0.33	41.83	19 9 48.84	4.03
	*− 8° 25′ . . .	3	30.6	32.1	34.6	46.6	48.5	49.9	51.6	53.0	5.2	7.7	9.4	17 49.93	0.28	41.84	19 17 7.81	3.76
	*− 8° 25′ . . .	4	19.0	20.7	22.4	24.2	26.6	. .	27.5	30.1	31.7	33.5	35.3	17 57.10	0.35	41.84	19 17 14.91	3.76
	π Draconis . . .	5	. .	. .	. .	39.4	43.1	47.0	51.0	54.9	. .	. .	. .	20 47.08	0.19	41.84	19 20 5.05	2.97
	*+76° 14′ . . .	6	. .	. .	. .	4.7	10.8	18.3	24.8	31.4	. .	. .	. .	24 18.00	0.28	41.84	19 23 35.88	3.20
	B. A. C. 6702 . .	7	19.1	25.4	35.8	26.6	32.7	39.8	46.9	53.4	43.6	53.9	1.2	26 39.85	0.32	41.84	19 25 57.69	3.21
	κ Aquilæ	8	43.0	44.5	47.0	59.0	0.6	2.3	4.0	5.5	17.5	20.1	21.6	31 2.28	0.28	41.84	19 30 20.16	3.75
	B. A. C. 6752 . .	9	24.6	29.0	36.6	14.1	19.0	24.0	29.2	33.7	11.3	18.8	23.8	36 24.01	0.25	41.85	19 35 41.91	3.07
	B. A. C, 6775 . .	10	24.4	26.1	28.7	42.6	44.5	46.3	48.0	49.8	3.5	6.5	8.3	41 46.25	0.39	41.85	19 41 4.01	4.42
	B. A. C. 6808 (1st *)	11	. .	. .	. .	5.6	10.0	14.6	19.2	23.5	. .	. .	. .	44 14.58	0.21	41.86	19 43 32.51	3.04
	B. A. C. 6808 (2d *)	12	. .	. .	. .	5.0	9.0	13.9	18.4	22.5	. .	. .	. .	45 13.76	0.21	41.86	19 44 31.69	3.04
	ε Draconis . . .	13	24.5	28.7	35.8	10.8	15.5	20.0	24.8	29.3	4.2	11.6	16.2	49 20.13	0.24	41.86	19 48 38.03	3.07
	*+35° 0′ . . .	14	3.7	5.6	8.5	23.1	24.9	27.0	29.0	30.9	45.4	48.5	50.5	56 27.01	0.18	41.86	19 55 44.97	3.11
	τ Aquilæ	15	34.0	35.6	38.1	50.1	51.8	53.4	55.1	56.6	8.5	11.0	12.8	58 53.36	− 0.23	41.87	19 58 11.26	3.49
30	κ Ophiuchi . . .	16	6.7	8.4	10.8	23.0	24.6	26.2	28.0	29.6	41.6	44.1	45.6	52 26.21	+ 0.19	32.72	16 51 53.71	2.98
	O. Arg. S. 16298 .	17	4.0	5.8	8.4	21.7	23.4	25.2	27.1	28.8	42.0	44.6	46.3	58 25.21	0.34	32.72	16 57 52.83	3.61
	B. A. C. 5774 : .	18	9.4	11.1	13.6	25.5	27.0	28.5	30.2	31.8	43.7	46.2	47.7	2 28.61	0.22	32.72	17 1 56.11	3.18
	B. A. C. 5818 . .	19	16.4	18.1	21.0	. .	. .	. .	. .	. .	56.2	58.9	0.8	9 38.57	0.38	32.73	17 9 6.22	3.84
	*−30° 13′ . . .	20	. .	. .	. .	40.8	42.4	44.2	45.9	47.5	. .	. .	. .	9 44.16	+ 0.36	32.73	17 9 11.79	3.84
	*−31° 31′ . . .	21	37.0	39.1	. .	. .	. .	. .	. .	36.6	38.7	41.0	43.0	17 19.23	− 19.85	32.74	17 16 26.64	3.94
	*−32° 32′ . . .	22	. .	. .	. .	. .	. .	. .	. .	. .	8.3	10.6	12.4	27 10.43	20.08	32.75	17 26 17.60	4.04
	B. A. C. 5925 . .	23	. .	. .	. .	34.5	37.7	39.4	52.3	55.4	57.2	59.3	1.6	27 49.68	32.53	32.75	17 26 44.40	4.04
	*−35° 16 . . .	24	. .	. .	. .	12.5	15.5	17.3	30.5	33.4	35.5	37.9	40.5	30 27.89	− 33.58	32.76	17 29 21.55	4.16
	O. Arg. N. 17413 .	25	51.1	56.0	2.2	. .	. .	. .	. .	. .	24.8	31.2	35.1	37 43.40	+ 0.11	32.76	17 37 10.75	2.62
	*+68° 28′ . . .	26	. .	. .	. .	44.0	48.0	52.3	56.7	1.0	. .	. .	. .	37 52.40	0.06	32.76	17 37 19.70	2.62
	*+36° 10′ . . .	27	46.2	48.1	51.4	6.1	7.9	10.0	12.0	14.0	28.7	32.0	33.8	43 10.02	0.13	32.77	17 42 37.38	2.87
	Weisse (2) 1314 .	28	50.6	52.9	55.6	10.7	12.6	14.7	16.6	18.5	. .	. .	. .	44 6.52	8.15	32.77	17 43 41.90	2.87
	*+38° 12′ . . .	29	26.2	28.0	31.3	46.9	48.7	50.8	52.9	54.6	9.9	13.1	15.4	49 50.71	0.12	32.77	17 49 18.06	2.87
	*+36° 18′ . . .	30	36.5	38.4	41.5	56.4	58.2	0.3	2.3	4.3	19.0	22.0	23.8	55 0.25	0.13	32.78	17 54 27.60	2.90
	O. Arg. S. 17648 .	31	14.4	15.9	18.7	31.3	33.0	34.8	36.4	38.2	50.9	53.8	55.3	0 34.79	0.31	32.79	18 0 2.31	3.87
	*−28° 16′ . . .	32	33.8	35.7	38.7	51.3	53.0	55.1	56.9	59.0	11.4	13.7	15.9	4 54.96	+ 0.35	32.79	18 4 22.52	4.11
	O. Arg. S. 17797 .	33	. .	. .	. .	38.7	41.7	44.1	55.7	58.7	0.4	2.4	4.4	5 53.35	− 31.16	32.79	18 4 49.40	4.11
	μ Sagittarii . . .	34	. .	. .	. .	. .	. .	. .	33.1	35.8	37.4	39.2	41.1	7 37.32	− 36.19	32.79	18 6 28.34	3.89
	δ Ursæ Minoris . .	35	. .	. .	. .	4.3	0.9	3.7	0.5	3.1	. .	. .	. .	12 37.00	+ 0.11	32.80	. . . .	3.75
	ι Aquilæ	36	47.6	49.3	51.7	3.9	5.3	7.0	8.7	10.2	22.3	24.8	26.3	29 7.01	0.25	32.82	18 28 34.44	3.66
	*−1° 6′. . . .	37	3.9	5.5	8.0	19.9	21.4	23.2	24.9	26.4	38.3	40.7	42.2	36 23.13	0.22	32.82	18 35 50.53	3.52
	Weisse 887 .	38	9.2	11.0	13.2	25.3	26.8	28.4	30.0	31.5	43.6	46.0	47.6	37 28.42	0.22	32.83	18 36 55.81	3.53
	Lacaille 7926 . .	39	44.4	47.0	48.8	50.7	52.7	. .	5.7	8.8	10.8	12.8	15.0	49 29.67	0.49	32.84	18 48 57.32	4.50
	*−33° 25′ . . .	40	6.8	9.3	12.5	26.9	28.8	30.5	32.5	34.2	48.5	51.6	53.4	49 30.45	+ 0.40	32.84	18 48 58.01	4.50
	*−1° 30′ . . .	41	. .	. .	. .	. .	. .	. .	. .	. .	14.6	16.9	18.5	2 16.66	− 17.04	32.85	19 1 26.77	3.59
	Lalande 35791 .	42	51.5	53.0	55.5	. .	. .	. .	. .	. .	26.0	28.3	29.9	2 10.70	+ 0.23	32.85	19 1 38.08	3.59
	*−19° 18′ . . .	43	59.4	0.9	3.0	17.1	18.7	20.4	22.5	24.4	. .	. .	. .	10 13.30	7.16	32.86	19 9 47.60	4.05
	*−19° 16′ . . .	44	. .	. .	. .	51.9	53.6	55.3	56.9	58.8	. .	. .	. .	10 55.30	0.29	32.86	19 10 22.73	4.05
	π Draconis . . .	45	51.0	54.9	1.2	29.9	33.5	37.2	41.3	45.0	13.5	19.4	23.0	20 37.26	0.09	32.87	19 20 4.48	2.91
	*+76° 14′ . . .	46	. .	. .	. .	53.9	0.4	6.9	14.2	21.0	. .	. .	. .	24 7.28	0.09	32.88	19 23 34.49	3.07
	B. A. C. 6702 . .	47	7.9	15.1	26.1	15.9	22.6	29.3	36.6	43.1	33.7	43.6	50.2	26 29.46	0.11	32.88	19 25 56.69	3.08
	κ Aquilæ	48	33.5	35.1	37.6	49.6	51.0	52.7	54.5	55.9	8.0	0.5	12.0	30 52.76	0.25	32.88	19 30 20.13	3.77
	B. A. C. 6752 . .	49	13.6	18.8	26.8	4.0	8.7	13.7	18.9	23.8	0.9	8.7	13.4	36 13.75	0.10	32.89	19 35 40.96	3.09
.10	κ Ophiuchi . . .	50	57.5	59.2	1.7	13.7	15.3	17.1	18.7	20.3	32.4	34.9	36.4	52 17.02	+ 0.15	−23.56	. . . .	− 2.86

July 27. Image west 0^s.78, clamp east.
Image west 0 .22, clamp west.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
July 30, 18.2	− 32.80	− 0.064	− 0.20	+ 0.22
Aug. 10, 19.4	− 23.52	+ 0.015	− 0.12	+ 0.17

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right. Ascension.	Reducti to 1877.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	s.	s.	h. m. s.	s.
Aug. 10	B. A. C. 5887 . .	1	. .	. .	. .	22.7	27.6	32.9	38.2	43.5	. .	. .	. .	18 32.98	+ 0.15	−23.55	17 18 9.58	− 1.
Y.	B. A. C. 6029 . .	2	. .	. .	. .	25.0	26.9	29.0	30.9	32.8	47.3	50.5	52.3	44 36.84	− 7.60	23.55	17 44 5.69	4.1
	*−34° 42′ . . .	3	. .	. .	. .	1.2	3.9	6.0	. .	. .	. .	. .	. .	45 3.70	− 20.71	23.55	17 44 19.44	4.1
	*−34° 45′ . . .	4	46.6	48.9	52.0	6.6	8.4	10.3	12.3	14.0	. .	. .	. .	46 2.39	+ 8.17	23.55	17 45 47.01	4.1
	*−34° 45′ . . .	5	. .	. .	. .	26.1	28.0	30.1	32.0	33.8	48.5	51.6	53.2	46 37.91	− 7.60	23.55	17 46 6.76	4.1
	λ Ursæ Minoris . .	6	. .	. .	. .	. .	. .	40.0	10.0	36.0	. .	. .	. .	49 8.67	− 1 25.10	23.51	. . . .	4.
	τ Aquilæ	7	15.5	17.0	19.6	31.4	33.0	34.7	36.4	37.9	49.9	52.5	53.9	58 34.71	+ 0.16	23.51	19 58 11.36	3.5
	*−9° 15′ . . .	8	. .	. .	. .	14.0	15.4	17.0	18.7	20.1	. .	. .	. .	4 17.04	0.18	23.51	20 3 53.71	3.8
	*−9° 12′ . . .	9	. .	. .	. .	46.9	48.3	50.1	51.8	53.5	. .	. .	. .	6 50.12	0.18	23.51	20 6 26.79	3.8
	*−9° 12′ . . .	10	13.3	15.0	16.9	18.2	20.7	. .	21.6	24.2	26.0	27.8	30.0	6 51.37	+ 0.26	23.51	20 6 28.12	3.1
	B. A. C. 6969 . .	11	. .	. .	. .	26.3	28.0	30.1	32.2	34.0	48.9	52.0	53.8	10 38.16	− 7.92	23.51	20 10 6.73	3.1
	*+36° 44′ . . .	12	8.2	10.3	13.5	. .	. .	. .	. .	. .	51.3	54.3	56.1	15 32.28	+ 0.13	23.51	20 15 8.90	3.1
	B. A. C. 7006 . .	13	. .	. .	. .	34.5	36.4	38.2	40.6	42.4	. .	. .	. .	15 38.44	+ 0.11	23.51	20 15 15.04	3.1
	*+36° 44′ . . .	14	. .	. .	. .	16.5	18.3	20.4	22.4	24.4	39.3	42.6	44.4	17 28.54	− 7.96	23.51	20 16 57.07	3.1
	π Capricorni. . .	15	23.9	25.7	28.2	40.8	42.4	44.2	45.9	47.6	0.2	2.7	4.2	20 44.16	+ 0.22	23.51	20 20 20.87	4.1
	ε Delphini . . .	16	8.4	10.5	12.2	13.7	16.4	. .	17.6	20.4	21.9	23.5	25.4	27 47.00	0.22	23.51	20 27 23.71	3.5
11	α^1 Herculis . . .	17	8.8	10.4	13.1	25.4	27.0	28.7	30.4	32.0	44.4	46.8	48.4	9 28.67	0.16	23.61	17 9 5.22	2.8
	Lacaille 7259 . .	18	2.4	4.2	7.5	21.9	23.7	25.7	27.7	29.9	44.3	47.2	49.0	16 25.77	0.26	23.61	17 16 2.42	3.9
	*−38° 32′ . . .	19	45.5	47.7	50.7	6.9	8.8	10.5	12.2	14.0	. .	. .	. .	27 2.04	8.55	23.61	17 26 46.98	4.1
	*− 7° 48′ . . .	20	1.4	2.9	5.5	17.4	18.8	20.6	22.3	23.8	36.0	38.4	39.9	38 20.64	0.18	23.61	17 37 57.21	3.3
	μ Herculis . . .	21	43.2	44.9	47.7	1.2	3.0	4.9	6.9	8.5	. .	. .	. .	41 57.56	7.47	23.61	17 41 41.42	2.8
	Lalande 33472 .	22	44.6	46.7	49.7	4.4	6.4	8.4	10.6	12.3	27.2	30.2	32.1	6 8.42	0.15	23.61	18 5 44.96	− 2.7
	δ Ursæ Minoris. .	23	. .	. .	. .	29.0	55.0	23.0	50.0	17.0	. .	. .	. .	12 22.80	1.29	23.61	. . . .	+ 0.1
	ι Aquilæ. . . .	24	38.6	40.1	42.7	54.7	56.3	57.8	59.6	1.1	13.2	15.7	17.2	28 57.91	0.18	23.61	18 28 34.48	− 3.6
	*−1° 6′. . . .	25	55.0	56.7	59.1	11.0	12.5	14.1	15.7	17.4	29.3	31.8	33.2	36 14.16	0.17	23.61	18 35 50.72	3.4
	Weisse 887 . .	26	0.0	1.6	4.1	15.7	17.5	19.1	21.0	22.5	34.3	36.9	38.3	37 19.18	0.17	23.61	18 36 55.74	3.4
	*−9° 29′ . . .	27	51.9	53.4	56.0	8.1	9.8	11.3	12.9	14.5	26.5	29.1	30.5	52 11.27	0.19	23.61	18 51 47.85	3.7
	Gr. Cat. 1710 . .	28	18.0	20.3	24.0	41.5	43.6	46.1	48.4	50.7	8.3	11.7	13.8	13 46.04	0.16	23.61	19 13 22.59	2.8
	π Draconis . . .	29	41.4	45.7	51.8	20.1	24.1	28.0	32.0	35.5	4.3	10.3	13.9	20 27.92	0.23	23.61	19 20 4.54	2.6
	*+76° 14′ . . .	30	. .	. .	. .	43.7	50.6	57.5	4.5	10.9	. .	. .	. .	23 57.44	0.35	23.61	19 23 34.18	2.5
	B. A. C. 6702 . .	31	58.6	5.6	16.2	6.4	12.6	19.7	27.1	33.1	23.9	33.9	40.2	26 19.75	0.39	23.61	19 25 56.53	2.5
	B. A. C. 6752 . .	32	4.5	9.6	17.7	. .	. .	. .	. .	. .	51.8	59.6	4.3	36 4.58	0.32	23.61	19 35 41.29	2.6
	B. A. C. 6808 (2d *)	33	1.0	5.5	12.4	45.5	49.8	54.3	59.0	3.4	37.0	43.8	47.7	44 54.49	0.27	23.61	19 44 31.15	2.7
	ε Draconis . . .	34	. .	. .	. .	51.6	56.2	0.7	5.8	10.2	. .	. .	. .	49 0.90	0.25	23.61	19 48 37.44	2.7
	τ Aquilæ. . . .	35	. .	. .	. .	31.6	33.2	34.9	36.6	38.2	. .	. .	. .	58 34.90	0.15	23.61	19 58 11.44	3.5
	α^2 Capricorni. . .	36	21.4	23.1	25.7	37.8	39.4	41.2	42.9	44.4	56.7	59.3	0.8	11 41.15	0.19	23.61	20 11 17.73	4.0
	*+37° 49′ . . .	37	46.2	48.2	51.5	6.6	8.6	10.7	12.5	14.5	29.3	32.6	34.8	33 10.50	0.15	23.61	20 32 47.04	3.1
	*−13° 58′ . . .	38	. .	. .	. .	54.6	56.1	57.8	59.4	1.0	. .	. .	. .	41 57.78	0.19	23.61	20 41 34.36	4.0
	31 Vulpeculæ. . .	39	57.0	58.8	1.6	14.8	16.5	18.5	20.2	22.0	35.4	38.1	39.7	47 18.42	0.15	23.61	20 46 54.96	3.3
	17 Delphini . . .	40	54.4	56.1	58.7	11.0	12.6	14.2	16.0	17.4	29.8	32.3	33.8	50 14.21	0.16	23.61	20 49 50.76	3.4
	29 Capricorni. . .	41	3.7	5.4	8.1	20.5	22.1	23.8	25.5	27.1	39.5	42.0	43.7	9 23.76	0.20	23.61	21 9 0.35	4.1
	ι Pegasi	42	30.4	32.0	34.8	47.4	49.1	50.9	52.6	54.2	6.8	9.4	11.0	16 50.78	0.15	23.61	21 16 27.32	3.4
	B. A. C. 7466 . .	43	25.9	27.8	30.6	43.9	45.5	47.3	49.2	50.9	4.2	6.9	8.6	23 47.35	0.23	23.61	21 23 23.87	4.4
16	μ Sagittarrii . . .	44	26.5	28.3	31.0	43.6	45.4	47.0	48.9	50.5	3.4	6.1	7.6	6 47.12	0.21	19.10	. . . .	3.7
	B. A. C. 6212 . .	45	18.9	20.7	23.8	37.9	39.7	41.5	43.6	45.2	59.6	2.3	4.1	13 41.57	0.25	19.10	18 13 22.72	4.1
	*−29° 31′ . . .	46	35.0	36.9	39.7	. .	. .	. .	. .	. .	14.5	17.4	19.0	16 57.08	0.25	19.10	18 16 38.23	4.0
	*−29″ 31′ . . .	47	. .	. .	. .	54.9	56.6	58.4	0.4	2.0	. .	. .	. .	16 58.46	0.23	19.10	18 16 39.59	4.0
	ι Aquilæ . . .	48	33.9	35.6	37.9	50.0	51.4	53.2	54.9	56.5	8.6	11.2	12.6	28 53.25	0.18	19.10	. . . .	3.5
	λ Ursæ Minoris. .	49	14.0	43.0	. .	. .	. .	. .	. .	. .	. .	. .	. .	30 58.50	16 36.78	19.10	. . . .	0.3
17	*−7° 49′ . . .	50	56.6	58.3	0.6	13.0	14.6	16.2	17.8	19.4	31.4	34.0	35.5	38 16.13	+ 0.17	−19.14	17 37 57.16	− 3.3

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Aug. 11, 19.1	− 23.61	+ 0.002	− 0.08	+ 0.17
16, 18.3	− 19.10	0.000	− 0.10	+ 0.16
17, 19.9	− 19.10	+ 0.016	− 0.09	+ 0.16

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
77. g. 17 Y.	μ Herculis	1	38.7	40.5	43.4	56.9	58.5	0.3	2.2	3.9	17.3	20.3	21.9	42 0.35	+ 0.13	−19.13	17 41 41.35	− 2.71
	B. A. C. 6046	2	15.8	17.9	20.9	35.4	37.2	39.3	41.2	43.0	57.7	0.5	2.5	46 39 22	+ 0.26	19.13	17 46 20.35	4.07
	*−34° 22'	3	. .	. .	. .	18.0	21.1	22.9	36.1	39.4	41.2	43.2	45.4	47 33.41	− 33.37	19.13	17 46 40.91	4.07
	*−34° 22'	4	. .	. .	. .	49.0	50.8	52.7	54.7	56.8	. .	. .	. .	48 52.80	+ 0.25	19.13	17 48 33.92	4.08
	35 Draconis	5	. .	. .	. .	3.1	9.9	17.3	24.1	31.5	. .	. .	. .	55 17.18	0.28	19.13	17 54 58.33	1.22
	*−37° 40'	6	44.1	46.1	49.2	. .	. .	. .	. .	. .	27.7	30.4	32.4	6 8.32	0.29	19.13	18 5 49.48	4.35
	*−37° 41'	7	2.1	3.9	7.2	. .	. .	. .	. .	. .	45.2	48.5	50.4	6 26.22	0.29	19.13	18 6 7.38	− 4.35
	*+85° 40'	8	. .	. .	. .	22.8	41.6	2.8	24.6	45.7	. .	. .	. .	13 3.50	0.80	19.12	18 12 45.18	+ 1.12
	1 Aquilæ	9	33.9	35.6	38.1	50.2	51.6	53.4	55.0	56.5	8.8	11.2	12.7	28 53.36	0.18	19.12	18 28 34.42	− 3.57
	Lalande 34831	10	. .	. .	. .	48.4	52.8	58.3	3.3	8.7	. .	. .	. .	34 58.30	0.21	19.12	18 34 39.39	1.92
	O. Arg. N. 18534	11	46.5	52.2	0.5	39.5	44.2	49.8	55.2	0.8	39.8	47.7	52.4	36 49.87	0.24	19.12	18 36 30.99	1.93
	Lalande 35006	12	. .	. .	. .	15.6	20.8	26.6	31.8	36.7	. .	. .	. .	38 26.30	0.21	19.12	18 38 7.39	1.94
	29 Sagittarii	13	24.6	26.2	29.0	41.6	43.2	45.1	46.8	48.4	1.1	3.9	5.3	42 45.02	0.20	19.12	18 42 26.10	3.94
	Lalande 34990	14	44.4	46.2	48.8	1.4	3.1	4.8	6.8	8.4	21.2	23.6	25.2	44 4.90	0.20	19.12	18 43 45.98	3.94
	Lalande 34393	15	51.0	52.7	55.4	. .	. .	. .	. .	. .	27.6	30.2	31.9	44 11.47	0.21	19.12	18 43 52.56	3.94
	*−33° 28'	16	55.1	57.3	0.1	. .	. .	. .	. .	. .	36.4	39.3	41.1	48 18.22	0.26	19.12	18 47 59.36	4.43
	*−33° 28'	17	16.0	18.1	20.9	. .	. .	. .	. .	. .	57.3	0.1	2.0	48 39.07	0.26	19.12	18 48 20.21	4.44
	Lacaille 7926	18	. .	. .	. .	12.4	14.3	16.3	18.3	20.3	. .	. .	. .	49 16.32	+ 0.24	19.12	18 48 57.44	4.43
	*−33° 25'	19	. .	. .	. .	35.0	37.9	39.8	52.6	56.0	58.1	59.9	2.2	49 50.19	− 33.00	19.12	18 48 58.07	4.43
	Lacaille 7961	20	24.3	26.2	29.1	43.8	45.7	47.7	49.5	51.6	6.2	9.2	10.0	54 47.57	+ 0.25	19.12	18 54 28.70	4.52
	O. Arg. S. 19140	21	. .	. .	. .	19.8	21.4	23.1	24.8	26.2	38.8	41.4	43.0	2 29.81	− 0.53	19.12	19 2 4.16	3.88
	*−22° 15'	22	37.5	39.2	41.8	54.7	56.2	58.0	0.0	2.2	14.4	17.0	18.5	8 58.14	+ 0.21	19.11	19 8 39.23	4.11
	*−19° 13'	23	20.2	21.6	24.4	36.9	38.6	40.3	42.0	43.6	56.4	58.8	0.5	13 40.30	0.20	19.11	19 13 21.39	4.03
	Weisse (2) 556	24	16.2	18.1	21.3	36.7	38.5	40.4	42.5	44.5	59.4	2.2	4.3	19 40.37	0.13	19.11	19 19 21.39	2.92
	Lalande 36732	25	. .	. .	. .	26.7	28.6	30.6	32.7	34.6	. .	. .	. .	20 30.64	+ 0.12	19.11	19 20 11.65	2.94
	*+36° 58'	26	. .	. .	. .	55.9	59.0	0.8	14.5	17.8	19.7	21.8	24.0	21 11.69	− 34.61	19 11	19 20 27.97	2.93
	*+38° 55'	27	30.5	32.2	35.5	50.0	. .	54.9	. .	59.0	14.3	17.1	19.3	25 54.76	+ 0.13	19.11	19 25 35.78	2.92
	Lacaille 8158	28	4.9	7.1	10.7	. .	. .	. .	. .	. .	51.5	54.5	56.4	29 30.85	0.31	19.11	19 29 12.05	5.05
	14 Cygni	29	22.2	24.3	27.8	43.9	46.1	48.0	50.3	52.6	8.7	12.1	13.9	35 48.18	0.14	19.10	19 35 29.22	2.90
	B. A. C. 6775	30	1.0	2.9	5.5	19.6	21.2	23.0	25.0	26.8	40.4	43.3	45.2	41 23.08	0.23	19.10	19 41 4.21	− 4.46
	λ Ursæ Minoris	31	. .	. .	. .	38.0	1.0	34.0	1.0	22.0	. .	. .	. .	47 31.20	3.24	19.10	. . . .	+ 0.46
	*+34° 57'	32	10.6	12.7	15.7	. .	. .	. .	. .	. .	52.6	55.5	57.5	55 34.10	0.14	19.10	19 55 15.14	− 3.07
	*+34° 57'	33	17.4	19.4	22.6	. .	. .	. .	. .	. .	59.4	2.4	4.2	55 40.90	0.14	19.10	19 55 21.94	3.07
	*+35° 0'	34	40.4	42.3	45.4	. .	. .	. .	. .	. .	22.3	25.5	27.2	56 3.85	0.14	19.10	19 55 44.89	3.07
	τ Aquilæ	35	10.9	12.5	15.1	27.1	28.6	30.4	32.0	33.6	45.6	48.0	49.5	58 30.30	0.15	19.10	19 58 11.35	3.53
	*+33° 7'	36	59.4	1.2	4.4	18.5	20.3	22.3	24.3	26.3	40.7	43.5	45.3	2 22.38	0.13	19.10	20 2 3.41	3.12
	*−9° 12'	37	27.4	29.0	31.0	. .	. .	. .	. .	. .	2.1	4.3	6.1	6 46.75	0.19	19.10	20 6 27.84	3.90
	b^3 Cygni	38	. .	. .	. .	13.5	15.5	17.4	19.1	21.4	. .	. .	. .	10 17.38	0.12	19.10	20 9 58.40	3.10
	B. A. C. 6969	39	1.8	3.9	7.0	. .	. .	. .	. .	. .	44.6	47.5	49.4	10 25.70	0.14	19.10	20 10 6.74	3.10
	*−13° 37'	40	53.2	54.9	57.6	9.8	11.2	13.0	14.7	16.2	28.6	31.0	32.5	16 12.97	+ 0.19	19.09	20 15 54.07	4.03
	Weisse 359	41	. .	. .	. .	51.5	53.9	55.6	6.7	9.3	10.9	12.6	14.4	17 4.36	− 28.37	19.09	20 16 16.90	4.03
	π Capricorni	42	19.5	21.2	23.9	36.6	38.2	39.9	41.7	43.2	55.8	58.5	0.1	20 39.87	+ 0.20	19.09	20 20 20.98	4.18
	B. A. C. 7080	43	43.3	45.0	47.5	59.6	1.0	2.8	4.6	6.1	18.1	20.8	22.1	26 2.81	0.18	19.09	20 25 43.90	3.96
	*+37° 49'	44	41.7	43.6	46.7	2.0	4.0	6.2	8.4	10.4	25.5	28.4	30.4	33 6.12	0.13	19.09	20 32 47.16	3.14
	*+34° 58'	45	. .	. .	. .	7.3	9.2	11.2	13.2	15.1	. .	. .	. .	37 11.20	0.12	19.09	20 36 52.23	3.18
	*+34° 58'	46	. .	. .	. .	30.0	31.7	33.7	35.7	37.7	. .	. .	. .	37 33.76	0.12	19.09	20 37 14.79	3.18
	*−13° 58'	47	33.7	35.2	38.0	50.1	51.5	53.3	54.9	56.5	. .	. .	. .	41 46.65	6.86	19.09	20 41 34.42	4.28
	O. Arg. S. 20896	48	4.5	6.3	9.0	22.8	24.4	26.3	27.8	29.6	43.5	46.0	47.6	44 26.16	+ 0.23	19.09	20 44 7.30	4.53
	O. Arg. S. 20902	49	. .	. .	. .	53.0	55.6	57.5	9.5	12.5	14.3	16.3	18.2	45 7.11	− 31.13	19.09	20 44 16.89	4.53
	17 Delphini	50	50.1	51.7	54.4	6.4	8.1	9.7	11.5	13.1	25.4	27.8	29.5	50 9.79	+ 0.14	−19.09	20 49 50.84	− 3.51

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Aug. 17, 19.9	− 19.10	+ 0.016	− 0.09	+ 0.16

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reductio to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	m. s.	s.	h. m. s.	s.
Aug. 17 Y.	Weisse 1394	1	. .	.	.	1.1	2.7	4.4	6.1	7.6	. .	. .	. .	56 4.38	+ 0.18	−19.08	20 55 45.48	− 4.0
	*−12° 57′	2	52.2	53.8	6.3	. .	. .	. .	. .	. .	27.6	30.0	31.7	56 11.93	0.20	19.08	20 55 53.05	4.0
	O. Arg. S. 21115	3	0.5	2.6	.2	7.6	19.2	21.0	22.6	24.1	36.7	39.1	41.0	0 20.91	0.19	19.08	21 0 2.02	4.1
	Lacaille 8737	4	18.5	20.7	23.9	39.7	41.6	43.9	46.3	48.1	3.8	7.1	9.2	7 43.89	0.29	19.08	21 7 25.10	5.1
	1 Pegasi	5	25.9	27.6	30.2	43.0	44.4	46.3	48.1	49.7	2.2	5.0	6.6	16 46.27	+ 0.14	19.08	21 16 27.33	3.4
	Lalande 41624	6	. .	. .	. .	33.8	36.9	38.8	52.6	56.1	58.1	0.1	2.3	18 49.84	− 35.14	19.08	21 17 55.62	3.2
	*+38° 3′	7	. .	. .	. .	36.4	39.8	41.6	55.5	59.0	0.9	2.8	5.3	19 52.66	− 35.12	19.08	21 18 58.46	3 2
	*−23° 46′	8	53.7	56.0	57.7	10.9	12.0	14.5	16.2	18.0	31.0	33.7	35.5	23 14.55	+ 0.22	19.08	21 22 55.69	4.1
	*−25° 45′	9	39.9	41.7	44.6	57.8	58.5	1.3	3.0	4.8	18.3	20.9	22.6	27 1.22	0 22	19.08	21 26 42.36	4.4
	5 Pegasi	10	2.3	4.0	6.7	19.3	21.0	22.6	24.4	26.0	38.5	41.1	42.8	32 22.61	0.14	19.07	21 32 3.68	3.4
	κ Capricorni	11	50.0	51.5	54.5	6.9	8.7	10.4	12.2	13.8	26.5	29.1	30.7	36 10.39	+ 0.20	19.07	21 35 51.52	4.2
	ε Pegasi	12	. .	. .	. .	28.0	29.6	31.3	32.9	34.6	46.7	49.2	50.7	38 37.88	− 6.42	19.07	21 38 12.39	3.6
27	*+27° 48′	13	38.6	40.2	42.9	56.1	58.0	59.8	1.6	3.4	16.6	19.3	21.0	41 59.77	0.22	14.83	17 41 44.72	2.5
	*−34° 55′	14	. .	. .	. .	47.7	50.7	52.7	6.2	9.2	11.1	13.1	15.5	46 3.28	34.16	14.83	17 45 14.29	3.9
	*−34° 52′	15	43.7	45.3	48.2	3.0	4.7	6.7	8.7	10.6	25.2	28.3	30.2	48 6.78	0.19	14.83	17 47 51.76	3.9
	*−34° 52′	16	50.2	51.9	55.0	. .	. .	. .	. .	. .	32.0	35.1	36.9	48 13.52	0.20	14.83	17 47 58.49	3.9
	35 Draconis	17	. .	. .	. .	59.0	6.1	13.5	21.1	27.9	. .	. .	. .	55 13.52	0.93	14.83	17 54 57.76	c.2
	μ Sagittarii	18	22.7	24.3	26.9	39.6	41.3	43.1	44.8	46.4	59.2	1.8	3.5	6 43.05	0.18	14.84	18 6 28.03	3.6
	*−21° 5′	19	. .	. .	. .	. .	. .	. .	18.8	21.6	23.1	24.7	27.1	7 23.06	36.83	14.84	18 6 31.39	3.6
	O. Arg. S. 17946	20	. .	. .	. .	32.7	35.2	36.9	48.6	51.2	52.8	54.7	56.6	9 46.09	29.61	14.84	18 9 1.64	3.6
	O. Arg. S. 17956	21	. .	. .	. .	. .	. .	. .	14.2	17.0	18.6	20.3	22.3	10 18.48	36.31	14.84	18 9 27.33	3.6
	B. A. C. 6212	22	15.0	16.6	19.4	33.8	35.7	37.6	39.6	41.4	55.4	58.3	0.2	13 37.55	0.19	14.84	18 13 22.52	4.0
	*−29° 31′	23	31.2	32.8	35.7	. .	. .	. .	. .	. .	10.5	13.4	15.2	16 53.12	0.19	14.84	18 16 38.09	3.9
	*−29° 31′	24	. .	. .	. .	51.0	52.6	54.6	56.6	58.3	. .	. .	. .	16 54.62	0.17	14.84	18 16 39.61	3.9
	1 Aquilæ	25	30.0	31.5	33.9	46.2	47.6	49.3	51.0	52.5	4.5	7.1	8.8	28 49.31	0.18	14.84	18 28 34.29	3.4
	Lalande 34831	26	. .	.		43.7	48.6	54.1	59.3	4.5	. .	. .	. .	34 54.04	0.68	14.84	18 34 38.52	1.3
	O. Arg. N. 18534	27	. .	.		35.4	40.2	45.9	51.6	55.9	. .	. .	. .	36 45.80	0.69	14.84	18 36 30.27	1.3
	*+72° 19′	28	. .	.		31.4	36.5	41.8	47.1	52.5	. .	. .	. .	37 41.86	0.69	14.84	18 37 26.33	1.3
	Lalande 35006	29	. .	.		11.4	16.7	22.0	27.6	32.8	. .	. .	. .	38 22.10	0.69	14.84	18 38 6.57	1.3
	O. Arg. S. 19104	30	48.8	50.4	53.0	5.8	7.5	9.2	10.0	12.8	25.8	28.2	30.1	1 9.33	0.18	14.85	19 0 54.30	3.9
	21 Aquilæ	31	30.0	31.4	33.8	45.8	47.2	49.0	50.7	52.0	4.0	6.6	8.2	7 48.97	0.18	14.85	19 7 33.94	3.4
	*+46° 46′	32	. .	.	.	43.4	45.5	47.9	50.6	52.5	. .	. .	. .	12 47.98	0.30	14.85	19 12 32.83	2.5
	Gr. Cat. 1710	33	9.5	11.6	15.5	33.0	35.2	37.5	39.8	42.1	59.4	3.2	5.5	13 37.48	0.31	14.85	19 13 22.32	2.5
	Weisse (2) 556	34	12.8	14.5	17.6	32.7	34.5	36.7	38.6	40.7	55.4	58.3	0.6	19 36.58	0.26	14.85	19 19 21.47	2.8
	Lalande 36732	35	. .	. .	. .	22.7	24.8	26.9	28.8	30.7	45.6	48.8	50.9	20 34.90	8.35	14.85	19 20 11.70	2.8
	*+36° 58′	36	. .	.	. .	10.4	12.3	14.5	16.5	18.5	33.2	36.4	38.4	21 22.52	− 8.36	14.85	19 20 59.31	2.8
	*−41° 43′	37	33.4	36.0	38.1	40.5	43.4	. .	. .	. .	. .	. .	. .	28 38.28	+ 45.41	14.85	19 29 8.84	4.9
	Lacaille 8158	38	1.2	3.2	6.8	62.7	24.6	27.2	29.6	31.5	47.2	50.5	52.9	29 27.03	− 0.21	14.85	19 29 11.97	4.9
	B. A. C. 6775	39	57.4	58.9	1.8	15.6	17.3	19.1	21.1	22.8	36.6	39.3	41.0	41 19.17	0.18	14.86	19 41 4.13	4.4
	α Aquilæ	40	46.1	47.5	49.9	2.2	3.7	5.5	7.1	8.7	20.7	23.2	24.8	45 5.40	0.19	14.86	19 44 50.35	3.4
	λ Ursæ Minoris	41	. .	.	.	. .	. .	32.0	2.0	24.0	. .	. .	. .	49 0.00	1 38.50	14.86	. . . .	9.2
	*+40° 2′	42	. .	.	.	31.4	34.7	36.8	51.2	54.6	56.6	58.8	1.3	53 48.17	36.65	14.86	19 52 56.66	2.8
	B. A. C. 6857	43	. .	.	. .	11.4	13.2	15.7	17.7	19.6	. .	. .	. .	53 15.52	0.26	14.86	19 53 0.40	2.8
	*+33° 7′	44	55.9	57.5	0.5	14.9	16.7	18.6	20.5	22.2	36.7	39.6	41.5	2 18.60	0.19	14.86	20 2 3.55	3.0
	Weisse 81	45	54.3	55.8	58.2	10.5	12.2	13.8	15.4	17.1	29.3	31.8	33.5	6 13.81	0.18	14.86	20 5 58.77	3.9
	*+38° 21′	46	. .	.	.	22.4	24.2	26.2	28.5	30.3	45.5	48.7	50.8	9 34.58	8.51	14.86	20 9 11.21	2.9
	*−13° 37′	47	. .	. . .	. .	5.9	7.6	9.1	10.7	12.4	24.5	27.0	28.8	16 15.78	6.84	14.87	20 15 54.07	4.0
	π Capricorni	48	15.7	17.3	20.0	32.6	34.2	35.9	37.5	39.4	51.8	54.5	56.2	20 35.92	0.18	14.87	20 20 20.87	4.1
28	ι Piscium	49	36.6	38.1	40.5	52.5	54.1	55.7	57.3	58.9	10.9	13.3	15.0	33 55.72	0.19	14.31	23 33 41.22	3.7
	77 Pegasi	50	5.5	6.9	9.7	21.7	23.2	25.0	26.6	28.1	40.3	42.8	44.5	37 24.94	− 0.20	−14.31	23 37 10.43	− 3.6

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Aug. 27, 19.1	− 14.85	− 0.014	− 0.04	− 0.18
28, 1.9	− 14.24	+ 0.029	− 0.13	− 0.18

Aug. 18. Image west 0ʳ.13; clamp west.
Image west 0ʳ.54; clamp east.

	OBJECT.	Number.	I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
7.														m. s.	s.	s.	h. m. s.	s.
.28	*+63° 6′	1	45.8	49.1	54.2	..	..	..	..	..	1.3	6.7	10.4	42 27.92	− 0.67	−14.30	23 42 12.95	− 3.91
	*+63° 6′	2	..	..	..	28.8	32.3	36.1	39.5	41.8	..	..	..	42 35.70	0.63	14.30	23 42 20.77	3.91
	*+20° 51′	3	56.5	58.1	0.9	13.3	15.1	17.0	18.9	20.5	33.3	35.9	37.6	47 17 01	0.24	14.30	23 47 2 47	3.58
	B. A. C. 8355 (1st *)	4	51 8	55.5	1.3	..	..	..	..	..	14.1	20.3	24.2	56 37 87	0.74	14.30	23 56 22.83	4 08
	B. A. C. 8355 (2d *)	5	..	..	..	32.6	36.0	40.3	44.3	47.8	..	..	..	56 40.20	0.70	14.30	23 56 25.20	4.08
	Weisse 90	6	45.8	47.3	49.6	1.4	3.3	4.8	6.5	8.3	21.1	22.5	24.1	7 4.96	0.19	14.29	0 6 50.48	3.67
	Weisse 112	7	22.5	23.9	26.4	38.3	39.8	41.5	43.0	44.6	56.5	59.1	0.7	8 41.48	0.19	14.29	0 8 27.00	3.67
	*+14° 12′	8	3.0	4.7	8.0	25.0	27.0	29.4	31.6	33.7	50.5	53.9	56.0	15 29.35	0.30	14.29	0 15 14.76	3.64
	*+15° 21′	9	40.5	42.0	44.7	57.0	58.6	0.4	2.0	3.5	16.0	18.6	20.3	23 0.33	0.20	14.28	0 22 45 85	3.57
	49 Piscium	10	22.2	23.8	26.2	38.6	40.3	42.0	43.7	45.3	57.6	0.2	1.9	24 41.98	0.20	14.28	0 24 27.50	3.57
	B. A. C. 122	11	11.7	12.2	14.8	27.2	28.8	30.5	32.2	33.8	46.2	48.7	50.5	25 30.60	0.20	14.28	0 25 16.12	3.57
	*+36° 8′	12	28.6	30.7	33.7	..	..	..	..	..	11.1	14.4	16.3	28 52 47	0.33	14.28	0 28 37.86	3.59
	Lalande 849	13	..	..	..	49 0	51.0	53.2	55.1	57.0	..	..	..	28 53.06	− 0.31	14.28	0 28 38.47	3.59
	Weisse 583	14	0.6	2.2	4.7	16.7	18.2	19.8	20.5	23.0	..	..	..	35 13.21	+ 6.30	14.28	0 35 5.23	3.60
	Weisse 588	15	..	..	..	41.5	42.9	44.6	46.5	47.9	59.7	2.2	4.0	35 51.16	− 6.67	14.28	0 35 30.21	3 60
	O. Arg. S. 443	16	15.6	17.3	19.8	..	..	..	..	..	53.1	55.7	57.4	43 36.48	0.15	14.27	0 43 22 06	3.84
	O. Arg. S. 447	17	27.3	29.3	31.8	..	..	..	..	..	4.9	7.7	9.4	43 48.44	− 0.15	14.27	0 43 34.02	3.84
	Lalande 1492	18	23.7	25.4	28.6	43.7	45.6	47.8	50.0	51.7	..	..	..	47 39.56	+ 7.94	14.27	0 47 33 23	3.60
	Lalande 1504 (1st *)	19	..	..	..	4.5	6.5	8.5	10.8	12.5	..	..	..	48 8.56	− 0.32	14.27	0 47 53.97	3.60
	Lalande 1504 (2d *)	20	..	..	..	27.8	31.0	33.1	47.1	50.3	52.5	54.6	57.0	48 44.18	35.90	14.27	0 47 54 01	3.60
	64 Ceti	21	32.9	34.6	37.0	49.1	50.8	52.5	54.3	55.7	7.9	10.5	12.2	52 52.50	0.16	14.27	0 52 38.07	3.64
	*+11° 30′	22	51.2	52.7	55.3	7.2	8.7	10.5	12.1	13.7	25.6	28.0	29.6	56 10.42	0.18	14.27	0 55 55.97	3.54
	Weisse 969	23	..	..	..	39.4	40.9	42.7	44.3	46.0	58.1	0.6	2.3	56 49.29	6.65	14.27	0 56 28.37	3.54
	O. Arg. N. 1118	24	35.1	37.7	41.8	2.4	5.0	8.0	10.8	13.2	33.8	38.3	41.0	1 7.92	0.49	14.27	1 0 53.16	3.88
	B. A. C. 385	25	19.1	21.0	24.0	38.5	40.4	42.4	44.4	46.4	0.7	3.9	5.8	10 42.42	0.13	14.26	1 10 28.03	3.83
	B. A. C. 417	26	27.9	29.9	32.8	47.9	49.9	52.0	54.2	56.0	11.0	14.3	16.5	16 52.04	0.13	14.26	1 16 37.65	3.83
	Polaris	27	..	..	..	..	..	..	..	24.0	13.0	22.0	..	26 59.67	12 29.50	14.25	. . . .	33.67
	*+13° 36′	28	23.1	24.6	27.2	39.5	41.0	42.7	44.3	45.8	58.2	0.9	2.5	43 42.71	0.22	14.25	1 43 28.24	3.38
	B. A. C. 578	29	58.7	0.6	2.8	19.1	21.2	23.2	25.5	27.4	42.9	46.2	48.2	48 23.25	0.13	14.24	1 44 8.88	3.57
	*+13° 57′	30	0.5	2.0	4.9	16.7	18.4	20.1	21.6	23.5	35.6	38.4	40.0	59 20.15	0.22	14.24	1 59 5.69	3.33
	ξ^1 Ceti	31	27.2	28.9	31.5	43.3	44.9	46.7	48.3	49.9	1.8	4.3	6.0	6 46.62	0.20	14.23	2 6 32.19	3.28
	ξ Arietis	32	11.8	13.3	15.9	27.9	29.5	31.2	32.9	34.4	46.5	49.2	50.9	18 31.23	0.21	14.23	2 18 16.79	3.24
	B. A. C. 750	33	..	..	..	..	..	..	23.0	25.7	27.3	28.9	30.8	20 27.14	34.94	14.23	2 19 37.97	3.21
	75 Ceti	34	52.4	53.8	56.4	8.2	9.8	11.4	13.0	14.7	26.5	29.0	30.7	26 11.45	0.18	14.22	2 25 57.05	3.16
	B. A. C. 803	35	46.4	47.9	50.8	4.7	6.4	8.3	10.4	12.1	26.0	29.0	30.8	31 8.44	0.13	14.22	2 30 54.09	3.09
	Lalande 5181	36	49.9	51.7	54.7	9.6	11.4	13.5	15.5	17.5	32.3	35.5	37.5	42 13.55	0.32	14.22	2 41 59 01	3.43
	τ Persei	37	20.1	22.6	26.5	45.8	48.5	51.0	53 9	56.3	15 8	20 2	22.5	45 51.20	− 0.47	14.21	2 45 36.52	3.79
	*+14° 40′	38	48.7	50 4	52.7	5.0	6.7	8.4	10.0	11.6	..	..	..	52 1.69	+ 6.48	14.21	2 51 53.96	3.14
	*+14° 40′	39	25.5	27.0	29.2	41.8	43.2	45.3	47.0	49.0	0.5	3.0	4.9	52 45.13	− 0.22	14.21	2 52 30.70	3.14
	α Ceti	40	49.4	50.8	53.3	5.2	6.8	8.5	10.0	11.7	23.6	26.1	27.8	56 8.47	0.19	14.21	2 55 54.07	3.04
	*+50° 42′	41	31.3	33.5	37.6	56.7	58.8	1.5	4.0	6.3	25.2	29.0	31.8	0 1.43	0.44	14.21	2 59 46.78	3.72
	*+38° 27′	42	37.8	40.4	42.5	44.3	47.8	..	4.8	7.7	9.6	11.7	14.4	5 24.10	− 0.43	14.21	3 5 9.46	3.41
	*+38° 27′	43	5.7	7.7	10.8	26.0	27.9	30 1	32.3	34.1	..	..	..	5 21.83	+ 7.93	14.21	3 5 15.55	3.41
	*+38° 27′	44	..	..	..	43.3	45.2	47.3	49.3	51.4	..	..	..	5 47.30	− 0.33	14.21	3 5 32.76	3.41
	ζ Arietis	45	47.2	48.8	51.5	4.1	5.7	7.6	9.3	11.0	23.7	26.4	28.2	8 7.59	0.24	14.21	3 7 53.14	3.14
9	μ Herculis	46	33.9	35.5	38.2	51.8	53.5	55.5	57.4	59.1	12.4	15.1	17.0	41 55.40	0.17	14.08	17 41 41.15	2.50
	B. A. C. 6029	47	56.2	58.0	1.0	15.8	17.5	19.6	21.5	23.5	37.8	40.8	42.9	44 19.51	0.27	14.08	17 44 5.16	3.89
	*−34° 45′	48	2.6	4 4	7.4	21.8	23.6	25.7	27.8	29.6	44.2	47.0	49.0	45 25.74	− 0 27	14 08	17 45 11.39	3.89
	*−34° 45′	49	12.2	13.9	16.5	31.6	33.1	35.2	37.4	39.1	..	..	..	45 27.38	+ 7.62	14.08	17 45 20.92	3.90
	*−34° 45′	50	..	..	..	8.2	11.0	13.4	..	..	..	..	..	46 10.87	− 21.30	−14.08	17 45 35.49	− 3.90

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Aug. 29, 19.1	− 14.05	+ 0.025	+ 0.07	− 0.18

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductio to 1877.
1877.														m. s.	s.	s.	h. m. s.	s.
Aug. 29 Y.	*−34° 45′ . . .	1	. .	. .	. .	. .	. .	. .	28.1	31.0	32.9	35.0	37.6	46 32.92	− 41.89	−14.08	17 45 36.95	− 3.9
	*−34° 45′ . . .	2	. .	. .	. .	18.8	21.9	23.8	. .	. .	. .	. .	. .	46 21.50	21.30	14.08	17 45 46.12	3.9
	*−34° 45′ . . .	3	. .	. .	. .	. .	. .	. .	55.5	58.5	0.5	2.6	5.1	47 0.44	41.89	14.08	17 46 4.47	3.9
	*−28° 2′ . . .	4	57.5	59.7	1.7	3.5	6.2	. .	14.7	17.2	18.9	21.0	23.4	50 40.38	0.32	14.08	17 50 25.98	3.7
	*−28° 0′ . . .	5	29.6	31.4	34.4	37.7	39.5	41.5	43.2	44.9	58.4	1.2	3.2	50 41.36	0.24	14.08	17 50 27.04	3.7
	ψ² Draconis . . .	6	32.8	38.0	45.5	24.2	29.5	34.8	40.1	44.8	23.6	31.6	37.0	57 34.72	0.37	14.08	17 57 20.27	0.8
	*−27° 32′ . . .	7	23.8	25.4	28.2	41.6	43.4	45.2	47.1	48.9	2.3	5.1	7.0	6 45.27	0.24	14.07	18 6 30.96	3.8
	*−17° 24′ . . .	8	59.4	1.6	4.0	16 9	18.4	20.0	21.7	23.2	35.8	38.4	40.0	10 19.91	0.21	14.07	18 10 5.66	3.5
	O. Arg. S. 18075 .	9	28.5	30.0	32.4	45.0	46.9	48.6	50.1	51.7	4.1	6.9	8.6	13 48.43	0.21	14.07	18 13 34.15	− 3.5
	δ Ursæ Minoris . .	10	. .	. .	. .	. .	. .	. .	. .	. .	. .	7.0	35.0	17 21.00	5 13.05	14.07	. . . .	+ 6.5
	ι Aquilæ . . .	11	29.2	30.7	33.2	45.2	46.7	48.5	50.1	51.6	3.7	6.3	7.7	28 48.45	0.19	14.06	18 28 34.20	− 3.4
	Lalande 3483 . .	12	. .	. .	. .	42.3	47.4	53.2	58.3	3.6	. .	. .	. .	34 52.96	0.34	14 06	18 34 38.56	1 1
	O. Arg. N. 18534 .	13	. .	. .	. .	34.4	39.6	45.1	50.4	55.0	. .	. .	. .	36 44.90	0.34	14.06	18 36 30.50	1.1
	*+72° 19′ . . .	14	. .	. .	. .	30.4	35.5	40.6	46.2	50.8	. .	. .	. .	37 40.70	0.34	14.06	18 37 26.30	1.1
	Lalande 35006 .	15	. .	. .	. .	10.6	15.6	21.6	26.9	31.6	. .	. .	. .	38 21.26	0.34	14.06	18 38 6.86	1.1
	O. Arg. S. 18735 .	16	24.3	25.9	28.5	41.4	43.0	44.9	46.7	48.3	2.2	4.0	5.7	43 44.99	0.22	14.06	18 43 30.71	3.8
	O. Arg. S. 18913 .	17	7.5	9.0	11.7	24.4	26.0	27.7	29.4	31.0	43.7	46.4	48.1	52 27.72	0.21	14.06	18 52 13.45	3.8
	O. Arg. S. 18953 .	18	48.4	49.9	52.6	5.3	6.9	8 7	10.4	12.0	24.6	27.3	29.1	54 8.65	0.21	14.06	18 53 54.38	3.8
	ζ Aquilæ . . .	19	43.1	44.7	47.2	59.4	1.1	2.8	4.4	6.0	18.2	20.9	22.6	0 2.76	0.17	14.05	18 59 48.54	3.1
	Lalande 35791 .	20	. .	. .	. .	7.0	9.7	11.3	22.3	24.9	26.4	28.2	30.0	2 19.98	28.04	14.05	19 1 37.89	3.1
	O. Arg. S. 19306 .	21	33.0	34.5	37.4	50.0	51.7	53.6	55.5	57.2	9.8	12.9	14.7	8 53.66	0.22	14.05	19 8 39.39	3.9
	Gr. Cat. 1710 . .	22	8.8	10.9	14.5	31.9	34.1	36.6	39.2	41.2	58.7	2.4	4.7	13 36.64	0.19	14.05	19 13 22.40	2.5
	*+36° 47′ . . .	23	11.6	13.4	16.5	31.5	32.5	35.5	37.5	39.5	54.2	57.4	59.4	21 35.36	0.17	14.04	19 21 21.15	2.7
	*+38° 30′ . . .	24	39.6	41.5	44.6	59.9	1.8	3.9	6.1	8.0	23.3	26.4	28.5	34 3.96	0.17	14.04	19 33 49.75	2.8
	*+38° 32′ . . .	25	. .	. .	. .	23.4	26.9	28.7	41.9	44.6	46.6	48.6	50.3	35 38.88	35.78	14.04	19 34 49.06	2.8
	B. A. C. 6775 . .	26	56.5	58.1	0.7	14.6	16.4	18.4	20.3	22.0	35.5	38.6	40.6	41 18.34	− 0.25	14.03	19 41 4.06	4.4
	*+34° 59′ . . .	27	15.2	17.0	20.0	34.8	36.6	38.7	40.8	42.5	. .	. .	. .	43 30.70	+ 7.74	14.03	19 43 24.41	2.9
	*−37° 59′ . . .	28	33.5	35.3	38.5	. .	. .	. .	. .	. .	16.9	19.8	22.1	49 57.68	− 0.30	14.03	19 49 43.35	4.8
	*+40° 2′ . . .	29	45.7	47.7	50.8	. .	. .	. .	. .	. .	30.5	33.4	35.8	53 10.65	0.19	14.03	19 52 56.43	2.8
	B. A. C. 6857 . .	30	. .	. .	. .	10.5	12.5	14.7	16.8	18.8	. .	. .	. .	53 14.66	0.17	14.03	19 53 0.46	2.8
	ι² Capricorni. . .	31	12.5	13.8	16.4	28.7	30.2	31.9	33.5	35.0	47.3	49.9	51.6	11 31.89	0.20	14.02	20 11 17.67	3.9
	π Capricorni. . .	32	. .	. .	. .	31.7	33.2	35.0	36.9	38.5	51.0	53.6	55.4	20 41.91	− 7.04	14.02	20 20 20.85	4.1
Sept. 1	γ Aquilæ. . . .	33	22.8	24.5	27.0	39.2	40.8	42.5	44.2	45.7	57.8	0.2	1.8	40 42.41	+ 0.11	14.41	. . . .	3.3
	Lalande 37785. .	34	2.2	4.3	7.4	21.7	23.5	25.6	27.7	29.7	44.3	47.2	48.9	44 25.68	0.03	14.41	19 44 11.30	2.8
2	ω Piscium . . .	35	58.9	0.5	3.1	15.1	16.7	18 3	19.7	21.3	33.4	35.8	37.3	53 18.19	0.13	14.74	23 53 3.58	3.7
	B. A. C. 8374 . .	36	10.5	12.2	15.2	28.7	30.5	32.3	34.2	36.1	49.6	52.4	54.3	0 32.36	0.06	14.74	0 0 17.68	3.6
	γ Pegasi	37	52.5	54.3	56.8	9.2	10.7	12.4	14.2	15.8	28.2	30.8	32.2	7 12.46	0.10	14.73	0 6 57.83	3.6
	Radcliffe 73 . .	38	32.0	34.4	37.2	53.9	56.2	58.5	1.0	3.1	19.8	23.5	25.4	14 58.64	0.00	14.73	0 14 43.91	3.7
	Lalande 849 . . .	39	29.4	31.5	34.5	49.5	51.2	53.2	55.4	57.3	12.1	15.1	16.9	28 53.28	0.03	14.73	0 28.35.58	3.6
	*+4° 3′ . . .	40	40.1	41.8	43.8	45.2	47.4	. .	48.2	50.1	52.8	54.3	57.0	36 18.07	0.21	14.73	0 36 3.55	3.6
	*+4° 6′ . . .	41	. .	. .	. .	14.6	15.9	17.6	19.2	20.5	. .	. .	. .	36 17.56	0.15	14.73	0 36 2.96	3.6
	*+4° 3′ . . .	42	1.2	3.4	6.8	. .	. .	. .	. .	. .	35.9	38.1	39.6	36 20.83	+ 0.15	14.73	0 36 6.25	3.6
	*−1° 29′ . . .	43	. .	. .	. .	52.9	54.4	56.2	57.9	59.8	11.3	14.0	15.7	39 2.78	− 6.32	14.73	0 38 41.73	3.7
	O. Arg. S. 447 . .	44	27.3	29.0	31.6	44.8	46.3	48.4	50.0	51.7	5.0	7.6	9 3	43 48.27	+ 0.26	14.73	0 43 33.80	3.9
	Lalande 1492 . .	45	23.2	25.3	28.5	43.9	45.8	47.9	50.0	52.0	. .	. .	. .	47 39.58	8.29	14.73	0 47 33.14	3.
	Lalande 1504 (1st *)	46	. .	. .	. .	4.4	6.2	8.6	10.9	12.8	. .	. .	. .	48 8.58	0.02	14.73	0 47 53.87	3.
	64 Ceti.	47	32.7	34.5	37.2	49.2	50.9	52.6	54 3	55.8	8.1	10.7	12.3	53 52.57	0.20	14.73	0 53 38.04	3.
	B. A. C. 411 . .	48	27.8	29.6	33.0	48.1	49.9	51.8	54.0	56.0	11.4	14.3	16.3	16 52.02	+ 0.36	14.73	1 16 37.65	3.
	Polaris . . .	49	. .	. .	. .	. .	. .	. .	. .	. .	20.0	6.0	11.0	26 52.33	−12 18.28	14.72	. . . .	37.
	Weisse 643 . .	50	23.2	24.9	27.3	39.4	40.9	42.7	44.2	45.9	58.0	0.5	2.0	36 42.64	+ 0.19	−14.72	1 36 28.11	− 3.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Sept. 2, 1.6	− 14.72	+ 0.010	− 0.21	+ 0.15

Aug. 30. Image west $0^{s}.55$; clamp east.
Image west $0^{s}.16$; clamp west.
15. Larger.

server.		OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
															m. s.	s.	s.	h. m. s.	s.
7. l. 2	o	Piscium . . .	1	52.7	54.3	56.8	8.7	10.3	12.1	13.8	15.4	27.4	29.9	31.3	39 12.06	+ 0.12	−14.72	1 38 57.46	− 3.51
		*+13° 36′ . . .	2	23.2	24.7	27.2	39.6	41.0	43.1	44.8	46.4	58.5	1.0	2.7	43 42.93	0.11	14.72	1 43 28.32	3.50
		B. A. C. 578 . .	3	58.6	0.7	4.0	19.4	21.1	23.5	25.5	27.4	13.0	46.3	48.3	48 23.44	0.37	14.72	1 48 9.09	3.69
		O. Arg. S. 1219 .	4	38.8	40.7	43.4	56.4	58.2	59.9	1.7	3.4	16.6	19.2	20.8	54 59.92	0.26	14.72	1 54 45.46	3.49
		*+13° 57′ . . .	5	0.6	2.2	4.6	17.0	18.8	20.5	22.0	23.9	35.8	38.4	40.2	59 20.36	+ 0.10	14.72	1 59 5.74	3.46
		*+55° 17′ . . .	6	46.5	49.5	53.8	. .	. .	. .	. .	. .	17.0	51.3	53.9	11 20.33	− 0.03	14.71	2 11 5.59	4.14
	69	Ceti.	7	37.3	38.9	41.3	53.1	54.8	56.6	58.3	59.7	11.5	14.2	15.6	15 56.48	+ 0.15	14.71	2 15 41.92	3.34
	ξ	Arietis	8	. .	. .	. .	28.2	29.8	31.6	33.1	34.9	47.0	49.4	50.9	18 38.11	− 6.46	14.71	2 18 16.94	3.37
		B. A. C. 750 . .	9	33.2	34.8	37.3	49.6	51.2	52.9	54.5	55.9	8.0	10.8	12.2	19 52.76	+ 0.12	14.71	2 19 38.17	3.37
		*−34° 14′ . . .	10	39.0	41.0	44.1	58.4	0.2	2.2	4.1	5.9	20.7	23.6	25.4	33 2.24	0.33	14.71	2 32 47.86	3.22
	γ	Ceti.	11	54.3	56.0	58.5	10.4	12.0	13.5	15.0	16.7	28.8	31.4	32.7	37 13.57	0.14	14.71	2 36 59.00	3.25
		Weisse (2) 972. .	12	21.8	23.5	26.2	39.8	41.3	43.0	44.7	46.3	59.7	2.4	3.9	41 42.96	0.07	14.71	2 41 28.32	3.43
		Weisse (2) 1018 .	13	1.1	3.0	5.6	18.8	20.5	22.2	24.0	25.6	39.0	41.8	43.3	43 22.26	0.07	14.71	2 43 7.62	3.42
		Rumker 742 . .	14	23.0	24.5	27.3	40.4	41.8	43.5	45.1	46.9	0.0	2.5	4.2	48 43.56	0.07	14.71	2 48 28.92	3.38
		*+14° 39′ . . .	15	48.6	50.5	53.2	5.4	6.9	8.6	10.3	12.0	. .	. .	. .	52 1.94	6.79	14.71	2 51 54.02	3.28
		*+14° 41′ . . .	16	25.5	27.0	29.8	41.7	42.3	45.4	47.1	49.0	1.0	3.7	5.4	52 45.26	0.10	14.71	2 52 30.65	3.28
		*+37° 6′ . . .	17	8.1	10.4	13.5	28.7	30.3	32.2	34.3	36.5	51.4	54.7	56.6	58 32.43	0.03	14.71	2 58 17.75	3.57
		*+38° 27′ . . .	18	38.1	40.2	42.0	43.5	46.2	. .	4.8	8.0	10.2	12.6	14.7	5 26.03	0.12	14.71	3 5 11.44	3.58
		*+38° 30′ . . .	19	6.0	8.0	11.0	26.5	28.4	30.5	32.6	34.7	. .	. .	. .	5 22.21	8.30	14.71	3 5 15.80	3.59
		*+38° 30′ . . .	20	. .	. .	. .	43.6	45.8	47.6	49.8	51.9	. .	. .	. .	5 47.74	0.02	14.71	3 5 33.05	3.59
		Weisse (2) 376. .	21	23.3	25.2	28.1	43.3	45.2	47.2	49.3	51.4	6.4	9.6	11.2	19 47.29	+ 0.03	14.70	3 19 32.62	3.53
		O. Arg. S. 2302 .	22	. .	. .	. .	59.8	1.2	3.1	5.1	6.9	19.1	21.3	22.7	24 9.90	− 6.59	14.70	3 23 48.61	2.86
		*+31° 36′ . . .	23	17.3	18.8	21.7	35.9	37.7	39.6	41.6	43.5	57.5	0.2	1.9	27 39.61	+ 0.05	14.70	3 27 24.96	3.39
		*+31° 37′ . . .	24	48.7	51.0	53.5	7.8	9.5	11.5	13.3	15.0	29.3	32.1	33.8	29 11.41	0.05	14.70	3 28 56.76	3.39
		Weisse (2) 733 .	25	1.2	3.0	5.8	19.0	20.7	22.5	24.2	26.1	39.5	41.9	43.6	35 22.50	0.06	14.70	3 35 7.86	3.28
	η	Tauri	26	7.3	9.0	11.8	24.8	26.7	28.4	30.1	32.0	44.8	47.5	49.2	40 28.33	0.07	14.70	3 40 13.70	3.23
4	α	Pegasi	27	36.9	38.6	41.2	53.5	55.0	56.7	58.4	0.0	12.4	15.1	16.5	58 56.75	+ 0.09	15.05	22 58 41.79	3.71
	ι	Cassiopeæ. . .	28	6.6	9.7	14.6	37.2	40.4	43.4	46.6	50.1	13.3	17.9	20.6	1 43.67	− 0.09	15.05	23 1 28.53	3.67
		Weisse 185 . .	29	14.1	16.8	19.4	30.6	32.9	33.7	35.4	37.0	49.2	51.7	53.2	11 33.92	+ 0.20	15.05	23 11 19.07	4.08
		*+36° 50′ . . .	30	41.9	43.9	47.1	2.1	4.0	6.0	8.0	9.9	24.9	27.9	29.9	15 5.96	+ 0.02	15.05	23 14 50.93	3.61
		*+66° 15′ . . .	31	57.3	1.9	8.0	37.6	41.3	45.4	49.4	53.2	23.1	29.1	32.6	20 45.35	− 0.15	15.05	23 20 30.15	4.01
		*+35° 3′ . . .	32	. .	. .	. .	3.9	7.0	8.6	22.3	25.5	27.0	29.3	31.7	30 19.41	− 33.88	15.05	23 29 30.48	3.64
		Weisse (2) 639. .	33	53.0	55.0	58.3	12.7	14.6	16.6	18.7	20.5	. .	. .	. .	31 8.68	+ 7.93	15.05	23 31 1.56	3.64
		Weisse (2) 658. .	34	. .	. .	. .	37.0	38.9	41.0	42.9	45.0	59.5	2.6	4.2	31 48.89	− 7.90	15.05	23 31 25.94	3.64
	ι	Piscium . . .	35	. .	. .	. .	11.4	13.8	15.4	26.2	28.9	30.5	32.1	34.1	34 24.05	27.73	15.05	23 33 41.27	3.82
		*+63° 26′ . . .	36	6.4	10.0	15.8	42.2	45.9	49.6	53.3	56.1	23.3	29.1	32.2	41 49.45	− 0.09	15.05	23 41 34.31	4.05
		*+20° 51′ . . .	37	56.9	58.6	1.5	14.1	15.8	17.8	19.5	21.0	33.7	36.2	38.0	47 17.55	+ 0.07	15.05	23 47 2.57	3.68
		Lalande 47298. .	38	7.2	9.2	12.4	37.3	39.1	41.0	43.2	45.1	0.0	3.0	5.0	1 41.14	0.02	15.04	0 1 26.12	3.69
		Weisse 112 . .	39	22.7	24.5	26.9	38.8	40.3	42.1	43.6	45.2	57.1	59.7	1.0	8 41.99	0.14	15.04	0 8 27.09	3.78
		*+36° 16′ . . .	40	41.3	43.3	46.5	1.6	3.4	5.9	7.8	9.9	25.1	28.2	30.3	25 5.75	0.02	15.04	0 24 50.73	3.72
		*+36° 15′ . . .	41	21.2	23.7	25.9	27.9	31.2	. .	47.8	51.2	53.0	55.2	57.5	25 14.46	0.11	15.04	0 24 59.53	3.72
		*+33° 1′ . . .	42	44.6	46.4	49.3	3.4	5.2	7.2	9.3	11.0	. .	. .	. .	29 59.55	+ 7.75	15.04	0 29 52.26	3.71
	π	Andromedæ . .	43	. .	. .	. .	55.6	58.4	0.2	13.2	16.4	18.2	20.2	22.4	31 10.58	− 33.10	15.04	0 30 22.44	3.71
		Weisse 749 . .	44	. .	. .	. .	34.0	35.8	37.8	39.7	41.7	. .	. .	. .	30 37.80	+ 0.02	15 04	0 30 22.78	3.71
		Weisse 583 . .	45	1.0	2.6	5.3	17.2	18.8	20.4	21.9	23.6	. .	. .	. .	35 13.85	+ 6.02	15.04	0 35 5.43	3.72
		Weisse 588 . .	46	. .	. .	. .	. .	43.0	45.0	46.8	. .	0.2	2.6	4.2	35 53.63	− 8.50	15.04	0 35 30.09	3.72
	β	Ceti.	47	23.4	25.1	27.5	40.1	41.9	43.7	45.5	47.0	59.8	2.3	3.8	37 43.65	+ 0.24	15.04	0 37 28.85	3.94
		Lalande 1504 (1st *)	48	. .	. .	. .	28.5	31.4	33.4	47.5	50.7	52.8	54.9	56.7	48 44.49	− 35.43	15.04	0 47 54.02	3.76
		O. Arg. N. 1118 .	49	35.5	38.2	42.6	2.6	5.3	8.4	11.1	13.9	34.5	38.5	41.0	1 8.33	− 0.07	15.04	1 0 53.22	4.08
		Weisse 165 . .	50	41.3	42.9	45.5	57.8	59.4	0.9	2.6	4.3	16.6	19.1	20.7	13 1.01	+ 0.10	−15.04	1 12 46.07	− 3.62

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Sept. 4, 0.6	− 15.04	+ 0.07	− 0.23	+ 0.15

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductic to 1877.
														m. s.	s.	s.	h. m. s.	s.
1877. Sept. 4 Y.	*+38° 24′	1	16.1	18.2	21.[illegible]	. .	. .	. .	. .	. .	0.0	2.9	5.0	17 40.62	+ 0.02	−15.04	1 17 25.60	− 3.7
	*+38° 24′	2	. .	. .	. .	41.7	43.6	45.8	47.9	50.0	. .	. .	. .	17 45.80	0.00	15.04	1 17 30.76	3.7
	Polaris	3	. .	. .	. .	. .	. .	. .	. .	. .	24.0	7.0	13.0	26 54.67	−12 19.35	15.03	. . . .	38.2
	Weisse 643	4	23.3	25.1	27.0	39.8	41.2	43.0	44.7	46.2	58.3	0.7	2.5	36 42.95	+ 0.19	15.03	1 36 28.11	3.5
	Lalande 3390	5	2.4	4.5	7.6	22.5	24.2	26.2	28.3	30.3	45.2	48.1	49.9	45 26.29	0.02	15.03	1 45 11.28	3.7
	β Arietis	6	48.7	50.5	53.3	6.0	7.5	9.2	11.0	12.7	25.5	28.0	29.7	48 9.28	0.07	15.03	1 47 54.32	3.5
	64 Ceti	7	50.5	52.[illegible]	54.[illegible]	6.7	8.2	9.9	11.5	13.1	25.2	27.7	29.2	5 9.87	0.12	15.03	2 4 54.96	3.4
	ξ¹ Ceti	8	27.8	29.5	32.1	44.0	45.6	47.3	49.0	50.6	52.7	55.0	56.4	6 47.27	0.12	15.03	2 6 32.36	3.4
	Lalande 4238	9	55.5	57.2	59.8	12.4	14.0	15.7	17.5	19.1	31.5	34.3	35.7	11 15.70	0.08	15.03	2 11 0.75	3.5
16	ι Cassiopeæ	10	17.0	21.1	27.8	57.9	1.7	5.6	9.9	13.9	44.3	50.8	54.2	19 5.84	0.03	3.34	. . . .	5.5
	31 Arietis	11	42.8	44.5	47.1	59.2	0.7	2.4	4.0	5.6	18.0	20.4	21.9	30 2.42	0.12	3.34	2 29 59.20	3.6
	γ Ceti	12	43.3	44.9	47.4	59.3	0.9	2.[illegible]	4.0	5.7	17.6	20.2	21.6	37 2.49	0.14	3.34	. . . .	3.6
	17 Persei	3	40.2	42.0	45.2	59.4	1.3	3.4	5.4	7.2	21.7	24.7	26.7	44 3.38	0.08	3.34	2 43 40.12	3.9
	*+14° 41′	4	37.6	39.3	41.9	54.1	55.7	57.4	59.0	0.8	13.0	15.3	17.2	51 37.39	0.12	3.34	2 51 54.17	3.6
	α Ceti	5	38.[illegible]	40.1	42.8	54.7	56.2	57.8	59.4	1.0	12.8	15.4	16.8	55 57.77	0.14	3.34	. . . .	3.5
	*+50° 42′	6	20.5	22.9	27.1	45.6	48.0	50.8	53.4	55.8	14.9	18.7	20.7	59 50 76	0.05	3.34	2 59 47.47	4.4
18	δ Aquilæ	7	4.6	6.4	8.9	20.8	22.2	24.0	25.8	27.0	39.0	41.6	43.0	19 23.94	0.15	3.18	19 19 20.91	3.1
	*+34° 57′	8	9.6	11.5	14.9	29.2	31.1	33.0	35.1	37.0	51.5	54.6	56.4	43 33.08	+ 0.16	3.18	19 43 30.06	2.5
	Lalande 37785	9	.	. .	. .	10.0	11.7	13.7	15.8	17.7	32.5	35.5	37.1	44 21.75	− 7.75	3.18	19 44 10.82	2.5
	O. Arg. S. 20124	20	.	. .	. .	40.6	42.4	43.8	45.6	47.3	0.9	3.5	5.2	51 51.16	− 7.00	3.19	19 51 40.97	4.0
	δ Aquilæ	21	54.7	56.5	58.9	11.0	12.5	14.1	15.8	17.4	29.3	31.8	33.3	58 14.12	+ 0.15	3.19	19 58 11.08	− 3.2
	λ Ursæ Minoris	22	. .	. .	. .	. .	. .	. .	. .	. .	19.0	30.0	49.0	2 12.67	−15 27.21	3.19	. . . .	+ 33.6
	ε Delphini	23	7.0	8.5	11.0	23.4	24.9	26.7	28.3	29.9	41.9	44.4	46.0	27 26.55	+ 0.15	3.20	20 27 23.50	− 3.3
	76 Draconis	24	. .	. .	. .	1.7	13.3	24.5	37.3	48.6	. .	. .	. .	51 25.08	0.87	3.21	20 51 22.74	+ 0.0
	Lalande 41086	25	1.3	3.4	6.5	21.8	23.5	25.8	27.7	30.0	45.0	48.1	50.2	4 25 75	0.17	3.22	21 4 22.70	− 2.9
	5 Pegasi	26	46.1	47.9	50.7	3.1	4.6	6.5	8.3	9.7	22.4	25.1	26.6	32 6.45	0.15	3.23	21 32 3.37	3.3
	κ Capricorni	27	34.0	35.8	38.6	50.9	52.7	54.5	56.1	57.9	10.5	13.1	14.6	35 54.43	0.17	3.23	21 35 51.37	4.2
	11 Cephei	28	13.6	18.2	26.3	2.7	7.3	12.1	17.5	21.6	58.1	5.3	9.7	40 12.04	0.40	3.23	21 40 9.21	2.7
	μ Capricorni	29	22.6	24.4	26.8	39.2	41.7	12.5	44.2	45.8	58.1	0.5	2.1	46 42.54	0.16	3.23	21 46 39 47	4.1
20	Lalande 47298	30	5.9	8.2	11.3	25.9	28.1	30.0	32.3	34.0	48.7	51.7	53.8	1 29.99	0.26	4.01	0 1 26.24	3.8
	γ Pegasi	3	42.2	44.0	46.5	58.6	0.2	1.8	3.7	5.3	17.6	20.3	21.7	7 1.99	0.18	4.01	0 6 58.16	3.8
	Radcliffe 73	32	21.1	23.7	26.6	43.2	45.1	47.7	50.4	52.4	8.9	12.2	14.3	14 47.79	+ 0.30	4.01	0 14 44.08	3.9
	*+7° 25′	33	.	. .	. .	45.1	47.9	49.8	2.6	5.8	7.6	9.6	11.9	30 0.04	− 27.83	4.01	0 29 28.20	3.9
	*+4° 3′	34	48.1	49.6	52.1	4.2	5.8	.	9.2	11.0	22.6	25.1	26.5	36 7.42	+ 0.16	4.02	0 36 3.56	3.9
	β Ceti	35	. .	. .	. .	29.4	31.1	32.8	34.5	36.1	48.7	51.3	53.0	37 39.61	− 6.71	4.02	0 37 28.88	4.1
	Lalande 1492	36	33.4	35.4	37.6	39.3	41.4	. .	15.8	19.1	21.1	23.0	25.6	47 59.17	− 21.48	4.02	0 47 33.67	4.0
	64 Ceti	37	22.5	24.2	26.7	39.0	40.5	42.3	43.9	45.5	57.8	0.3	1.8	52 42.23	+ 0.13	4.02	0 52 38.34	4.0
	Weisse 969	38	. .	. .	. .	29.7	31.2	33.1	34.8	36.5	48.1	50.5	52.1	56 39.50	− 6.33	4.02	0 56 29.15	3.9
	μ Cassiopeæ	39	. .	. .	. .	8.8	11.7	14.2	16.9	19.9	40.1	44.3	46.9	0 25.35	− 10.70	4.00	1 0 10.65	4.4
	Weisse 42	40	55.5	57.1	59.3	12.0	13.4	15.1	16.8	18.3	30.6	33.1	34.4	5 15.05	+ 0.17	4.02	1 5 11.20	3.9
	Weisse 137	41	39.6	41.1	43.7	56.2	57.6	59.4	0.9	2.5	14.8	17.4	18.8	10 59.27	0.18	4.02	1 10 55.43	3.9
	Weisse 188 (1st *)	42	31.5	33.4	36.0	. .	. .	. .	. .	. .	7.0	9.5	11.1	13 51.43	0.19	4.02	1 13 47.60	3.9
	Weisse 188 (2d *)	43	. .	. .	. .	48.7	50.2	51.9	53.6	55.1	. .	. .	. .	13 51.90	0.17	4.02	1 13 48.05	3.9
	*+38° 24′	44	5.1	7.3	10.5	. .	. .	. .	. .	. .	49.0	52.3	54.0	17 29.70	+ 0.27	4.02	1 17 25.95	4.1
	*+38° 24′	45	30.8	33.0	34.9	36.9	39.0	. .	13.5	16.7	18.5	20.7	23.1	17 56.69	− 21.47	4.02	1 17 31.20	4.1
	Polaris	46	. .	. .	. .	. .	. .	. .	. .	. .	9.0	51.0	56.0	26 38.67	−12 6.65	4.02	. . . .	45.8
	ο Piscium	47	42.3	44.0	46.6	58.6	0.2	1.7	3.5	4.9	17.1	19.5	21.0	39 1.76	+ 0.16	4.03	1 38 57.89	3.8
	*+36° 47′	48	. .	58.3	1.2	16.2	17.8	20.1	22.3	24.2	38.9	41.9	. .	45 20.10	0.26	4.03	1 45 16.31	4.1
	β Arietis	49	38.3	39.9	42.6	55.3	57.0	58.5	0.4	1.8	14.8	17.4	19.0	47 58.64	+ 0.19	4.03	1 47 54.80	3.9
24	ζ Aquilæ	50	54.7	56.2	58.7	11.0	12.6	14.3	16.0	17.6	29.8	32.4	34.0	0 14.30	− 0.18	−26.07	18 59 48.05	− 2.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Sept. 16, 2.8	− 3.34	0.000	− 0.15	+ 0.15
18, 20.4	− 3.20	− 0.023	− 0.03	+ 0.15
20, 1.0	− 4.02	− 0.010	+ 0.09	+ 0.15
24, 21.1	− 26.07	+ 0.002	+ 0.06	− 0.19

Sept. 20. Image west 0ʳ.10; clamp west.
Image west 0ʳ.50; clamp east.

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
'7.														m. s.	s.	s.	h. m. s.	s.
. 24	*+36° 54′	1	15.8	17.7	20.7	35.8	37.7	39.7	41.7	43.8	. .	. .	. .	19 31.61	+ 7.91	−26.07	19 19 13.45	− 2.24
.	*+36° 54′	2	19.7	21.6	24.5	39.6	41.6	43.7	45.8	47.6	2.5	5.6	7.2	20 43.58	− 0.19	26.07	19 20 17.32	2.25
	*+36° 54′	3	. .	. .	. .	33.8	36.8	38.8	52.8	55.7	57.7	59.9	2.1	21 49.70	35.02	26 07	19 20 48.61	2.25
	Lacaille 8158	4	12.5	14.5	17.7	33.9	35.8	38.0	40.1	42.0	58.3	1.4	3.6	29 37.98	0.30	26.07	19 29 11.61	4.51
	*−10° 26′	5	. .	. .	. .	24.3	25.8	27.6	29.2	30.7	43.0	45.6	47.1	32 34.16	6.79	26.07	19 32 1.30	3.45
	B. A. C. 6775	6	8.5	9.9	12.7	26.5	28.4	30.2	31.9	33.7	47.4	50.2	52.0	41 30.13	0.25	26.07	19 41 3.81	4.06
	Lalande 37785	7	13.8	15.7	18.7	33.4	35.2	37.2	39.2	40.2	55.7	58.7	0.7	44 37.14	0.19	26.07	19 44 10.88	− 2.45
	λ Ursæ Minoris	8	. .	. .	. .	. .	. .	8.0	38.0	0.0	. .	. .	. .	48 35.33	1 34.06	26.07	. . . .	+ 40.62
	*+40° 2′	9	57.2	59.0	2.4	. .	. .	. .	. .	. .	42.3	45.2	47.4	53 22.25	0.21	26.07	19 52 55.97	− 2.36
	B. A. C. 6857	10	. .	. .	. .	21.8	23.9	26.0	28.3	30.3	. .	. .	. .	53 26.06	0.19	26.07	19 52 59.80	2.36
	*+33° 7′	11	6.6	8.3	11.3	25.5	27.4	29.3	31.2	33.1	47.3	50.4	52.2	2 29.33	0.19	26.07	20 2 3.07	2.60
	Weisse (2) 306	12	0.0	1.8	5.0	. .	. .	. .	. .	. .	43.5	46.9	48.8	9 24.33	0.21	26.07	20 8 58 05	2.51
	*+38° 21′	13	12.9	14.7	17.8	. .	. .	. .	. .	. .	56.4	59.7	1.7	9 37.20	0.21	26.07	20 9 10.92	2.51
	ε Capricorni	14	24.0	25.5	28.1	40.4	41.9	43.7	45.5	47.0	59.2	1.8	3.5	11 43.69	0.21	26.07	20 11 17.41	3.72
	*+36° 44′	15	58.9	0.9	3.8	18.8	20.7	22.8	24.9	26.6	41.7	44.7	46.9	17 22.79	0.19	26.07	20 16 56.53	2.61
	π Capricorni	16	26.7	28.4	30.9	43.6	45.2	47.0	13.7	50.3	2.8	5.5	7.0	20 46.92	0 22	26.07	20 20 20.63	3.91
	*−27° 42′	17	21.0	22.7	25.4	39.0	40.7	42.6	44.5	46.2	59.8	2.4	4.3	44 42.60	0.25	26.07	20 44 16.28	4.3:
	*−19° 30′	18	53.1	54.7	57.2	10.0	11.7	13.4	15.0	17.0	29.5	32.0	33.5	49 13.37	0.22	26.07	20 48 47.08	4.06
	B. A. C. 7269	19	49.6	51.2	53.6	5.5	7.1	8.7	10.3	11.9	23.8	26.4	23.1	52 8.75	0.19	26.07	20 51 42.49	3.49
	*−32° 50′	20	47.6	49.3	52.4	6.8	8.4	10.3	12.3	14.0	28.3	31.3	33.2	58 10.35	0.27	26.07	20 57 44.01	4.56
	Lacaille 8701	21	46.7	48.4	51.0	4.8	6.6	8.6	10.5	12.2	25.7	28.6	30.3	2 8.49	0.25	26.07	21 1 42.17	4.42
	Lalande 41086	22	24.7	26.	29.8	45.0	46.9	49.1	51.2	53.1	8.2	11.4	13.6	4 49.05	0.20	26.07	21 4 22 78	2.88
	B. A. C. 7378	23	51.4	52.9	55.5	8.3	10.0	11.8	13.4	15.1	27.9	30.5	32.1	10 11.72	0.22	26.07	21 9 45.43	4.17
	Weisse 364	24	16.7	18.4	20.7	33.0	34.5	36.2	37.9	39.4	51.6	54.2	55.9	17 36.23	0.21	26.07	21 17 9.95	3.93
	*+69° 56′	25	40.5	44.6	52.5	. .	. .	. .	. .	. .	17.7	26.7	31.5	22 5.58	0.41	26.07	21 21 39.10	2.18
	*+69° 56′	26	5.0	9.3	16.5	51.5	55.8	0.7	5.3	9.6	44.5	51.5	56.2	26 0.54	0.39	26.07	21 25 34 08	2.24
	Weisse (2) 871	27	57.3	59.0	1.9	. .	. .	. .	. .	. .	38.6	41.6	43.7	36 20.35	0.20	26.07	21 35 54.08	3.15
	*+74° 8′	28	14.8	16.7	19.6	. .	. .	. .	. .	. .	56.3	59.3	1.2	36 37.98	0.20	26.07	21 36 11.71	3.16
	μ Capricorni	9	46	47	50.1	2.3	4.1	5.7	7.5	9.0	21.2	23.9	25.6	47 5.74	0.21	26.07	21 46 39.46	4.11
	Weisse (2) 1196	30	12	14	17.0	31.7	33.6	35.6	37.6	39.4	54.1	57.3	59.2	50 35.61	0.19	26.07	21 50 9.35	3.22
	Lacaille 8989	3	55.0	56	59.5	13.3	14.9	16.9	18.7	20.5	34.2	37.0	38.8	54 16.86	0.25	26.07	21 53 50.54	4.55
	ξ Cephei (1st *)	32	16	20.	24.3	27.6	33.8	. .	51.5	57.2	0.4	4.5	9.0	0 42.49	0.48	26.07	22 0 15.94	2.94
	ξ Cephei (2d *)	33	59.	2	8.5	35.7	39.2	43.1	17.1	50.1	17.6	23.3	27.1	0 43.10	0.29	26.07	22 0 16.74	2.94
	Piazzi 33	34	53	35.4	37.9	50.4	52.0	53.8	55.5	57.0	9.4	12.1	13.7	8 53.73	0.18	26.07	22 8 27.48	3.57
	*−35° 7′	3	35	37.7	39.7	41.6	. .	. .	. .	1.3	3.2	5.2	7.8	15 21.50	0.36	26.07	22 14 55.07	4.83
	*−35° 7′	36	5.4	7.1	10.0	24.6	26.6	28.7	30.7	32.5	46.9	50.1	52.0	15 28.60	0.28	26.07	22 15 2.25	4.83
	*+36° 41′	37	.	.	. .	20.8	24.0	25.8	39.6	42.7	44.7	46.0	49.2	18 36.71	34.92	26.07	22 17 35.72	3.37
	η Aquarii	38	13.	15.6	17.0	29.1	30.7	32.3	34.0	35.5	47.3	49.8	51.7	29 32.29	0.19	26.07	22 29 6.03	3.91
	Lacaille 9196	39	56.	58.6	1.8	17.1	19.2	21.5	23.6	25.5	40.7	44.1	46.1	32 21.35	0.29	26.07	22 31 54.99	5.02
	*−14° 16′	40	11.4	13.3	14.9	15.7	19.2	. .	21.5	24.2	25.9	27.7	29.5	38 50.33	0.29	26.07	22 38 23.97	4.19
	*−14° 18′	4	37.4	38.9	41.4	. .	. .	. .	. .	. .	12.7	15.3	16.9	38 57.10	0.22	26.07	22 38 30.81	4.19
	*−14° 18′	42	.	.	. .	4.8	56.3	58.6	59.8	1.4	. .	. .	. .	38 58.06	0.20	26.07	22 38 31.79	4.19
	α Pegasi	43	48.4	49.9	52.4	4.7	6.3	8.6	9.8	11.4	23.7	26.2	27.9	59 8.06	0.18	26.07	22 58 41.81	3.77
	ι Cassiopeæ	44	18.4	21.	26.0	18.6	52.6	55.2	58.3	1.0	24.4	29.0	32.3	1 55.16	0.27	26.07	23 1 28.82	3.66
	Weisse 185	4	25.	27.1	29.8	41.9	43.5	15.1	46.9	48.5	0.7	3.1	4.8	11 45.18	0.21	26.07	23 11 18.90	4.17
26	ζ Aquilæ	46	52.	54.5	57.0	9.3	10.6	12.6	14.3	15.9	28.0	30.7	32.4	0 12.59	0.18	24.40	18 59 48.01	2.69
	Gr. Cat. 1710	47	18.2	20.	24.0	41.5	43.8	16.2	18.4	50.6	8.0	11.7	13.9	13 46.06	− 0.21	24.39	19 13 21.4	1.81
	*+36° 54′	48	46.2	17.	51.2	6.1	8.1	10.1	12.2	14.2	. .	. .	. .	18 2.00	+ 7.91	24.38	19 17 45.53	2.18
	*+36° 54′	49	20.4	22.2	25.3	40.5	42.4	44.4	46.5	48.5	3.4	6.7	8.5	18 44.44	− 0.19	24.38	19 18 19.87	2.19
	*+36° 54′	50	.	.	. .	58.9	1.7	3.6	5.7	7.7	. .	. .	. .	20 3.52	− 0.18	−24.38	19 19 38 96	− 2.19

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Sept. 26, 21.5	− 24.28	+ 0.046	+ 0.06	− 0.19

Date and observer.		OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.			Observed Right Ascension.	Reductio to 1877.0	
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.		Inst	Clock.			
1877.															m. s.		s.	s.	h. m. s.		s.
Sept. 26		*+38° 55′	1				55.2	57.3	59.3	1.4	3.7	17.7	20.7	22.7	26 7.25	−	8.52	−24.38	19 25 34.35	−	2.0
Y.		Weisse 722	2							4.0	6.5	8.0	9.6	11.6	31 7.94		34.98	24.37	19 30 8.59		3.4
		*−10° 26′	3	6.6	8.0	10.5	22.7	24.3	26.0	27.6	29.1	41.3	43.8	45.5	32 25.95		0.21	24.37	19 32 1.37		3.4
		O. Arg. S. 19941	4	35.0	36.8	39.4	52.9	54.6	56.4	58.2	59.9	13.3	16.0	18.0	39 56.41		0.24	24.36	19 39 31.81		3.9
		*+34° 59′	5	31.6	33.2	36.3	50.9	52.8	54.8	56.9	59.1	13.1	16.3	18.2	43 54.84		0.19	24.36	19 43 30.29		2.4
		Lalande 37785	6				31.5	33.3	35.4	37.4	39.3	53.7	56.9	58.8	44 43.29		8.10	24.36	19 44 10.83		2.4
		O. Arg. S. 20124	7				1.7	3.4	5.0	6.6	8.8				52 5.10		0.23	24.36	19 51 40.51	−	3.9
	λ	Ursæ Minoris	8									37.0	56.0	26.0	2 39.67		15 42.51	24.35	. . . .	+	43.0
		*+36° 44′	9	15.1	17.2	20.0	35.0	37.0	39.0	41.8	42.9	58.0	1.0	3.1	11 39.10		0.19	24.34	20 11 14.57	−	2.5
		*+36° 44′	10				11.0	12.7	14.9	16.9	18.8	33.8	36.7	38.8	12 22.95		8.27	24.34	20 11 50.34		2.5
		*+36° 46′	11				59.0	1.9	4.1	17.8	21.1	22.9	25.0	27.4	13 14.90		34.96	24.34	20 12 15.60		2.5
		*+36° 44′	12	57.2	59.0	2.1	17.0	18.7	20.8	23.0	24.8	39.8	42.9	44.8	17 20.92		0.19	24.34	20 16 56.39		2.5
	π	Capricorni	13	25.0	26.6	29.2	41.7	43.4	45.1	46.8	48.4	1.1	3.8	5.5	20 45.15		0.22	24.33	20 20 20.60		3.8
		B. A. C. 7080	14	48.7	50.3	52.8	4.8	6.5	8.2	9.8	11.3	23.5	26.0	27.6	26 8.14		0.21	24.33	20 25 43.60		3.6
		B. A. C. 7114	15	12.0	13.9	17.1	32.8	34.7	37.0	39.3	41.1	56.9	0.2	9.4	30 36.76		0.20	24.33	20 30 12.23		2.5
		*−9° 5′	16	25.8	27.2	29.7	31.8	33.3	35.1	36.7	38.2	0.4	2.8	4.4	34 35.04		0.20	24.32	20 34 10.52		3.6
		O. Arg. S. 20805	17	12.4	14.0	16.9	29.8	31.7	33.6	35.2	36.8	50.0	52.5	54.4	38 33.39		0.24	24.32	20 38 8.83		4.1
		B. A. C. 17195	18	13.7	15.4	18.0	31.1	32.8	34.7	36.5	38.1	51.0	53.8	55.6	41 34.61		0.23	24.32	20 41 10.06		4.1
		*+38° 52′	19				44.6	46.6	48.7	50.9	52.8	8.0	11.3	13.[illegible]	43 57.05		8.51	24.32	20 43 24.22		2.6
		B. A. C. 7255 (1st *)	20	21.1	23.0	24.7	26.2	28.9		29.2	31.8	33.4	35.0	37.0	49 59.03		0.26	24.31	20 49 34.46		3.4
		B. A. C. 7255 (2d *)	21	39.8	41.3	44.0	55.8	57.5	59.0	0.7	2.4	14.2	16.8	18.5	49 59.09		0.19	24.31	20 49 34.59		3.4
		Weisse 1394	22	50.3	51.6	54.2	6.5	8.1	9.7	11.5	13.2	25.3	27.8	29.6	56 9.80		0.21	24.31	20 55 45.28		3.8
		Lalande 41086	23	23.9	24.8	27.9	43.3	45.2	47.3	49.4	51.5	6.6	9.8	11.7	4 47.40		0.20	24.30	21 4 22.90		2.8
		*+38° 15′	24	0.8	3.2	5.2	7.3	10.4		27.5	30.6	32.4	34.3	36.8	4 48.85		0.29	24.30	21 4 24.26		2.8
		B. A. C. 7378	25	49.6	51.3	53.8	6.7	8.2	9.9	11.7	13.3	26.2	28.8	30.5	10 10.00		0.22	24.29	21 9 45.49		4.1
	β	Aquarii	26	14.1	15.6	18.0	29.9	31.6	33.3	34.9	36.5	48.4	51.0	52.6	25 33.26		0.20	24.28	21 25 8.78		3.8
	ξ	Aquarii	27	21.3	22.8	25.2	37.4	38.9	40.5	42.2	43.8	55.8	58.5	0.0	31 40.58	−	0.20	24.28	21 31 16.10		3.9
		Weisse (2) 871	28	55.6	57.4	0.2	14.6	16.5	18.6	20.6	22.4				36 10.74	+	7.63	24.28	21 35 54.09		3.1
		*+34° 7′	29				32.2	34.2	36.2	38.3	40.1	54.5	57.5	59.4	36 44.05	−	8.01	24.28	21 36 11.76		3.1
		B. A. C. 7584	30	28.4	30.1	32.9	46.1	47.8	49.7	51.5	53.1	6.1	9.0	10.7	40 49.58		0.18	24.27	21 40 25.13		3.3
		B. A. C. 7586	31				32.2	35.0	37.0	49.2	51.9	53.6	55.4	57.7	41 46.50		30.90	24.27	21 40 51.33		3.3
		*+38° 57′	32	24.6	26.5	29.8		46.9	49.2	51.3		8.5	11.7	13.8	45 49.14		0.20	24.27	21 45 24.67		3.1
		Weisse (2) 1196	33	10.0	12.0	15.2	29.8	31.6	33.8	35.8	37.7	52.3	55.5	57.5	50 33.75		0.19	24.26	21 50 9.30		3.2
		Lacaille 8989	34	53.0	54.8	57.4	11.3	13.1	15.0	16.8	18.5	32.2	35.0	36.8	54 19.90		0.25	24.26	21 53 50.39		4.5
	ξ	Cephei (1st *)	35	56.8	0.2	5.8	33.5	36.7	40.6	44.3	47.8	15.1	20.7	24.5	0 40.55		0.31	24.26	22 0 15.98		2.8
	ξ	Cephei (2d *)	36	15.3	19.7	23.5	26.8	33.0		50.4	56.4	59.9	3.9	8.1	0 41.70		0.48	24.26	22 0 16.96		2.8
		Piazzi 33	37	32.0	33.5	36.1	48.4	50.1	51.8	53.6	55.2	7.5	10.2	11.9	8 51.85		0.18	24.25	22 8 27.42		3.5
		*−35° 7′	38	3.5	5.2	8.2	23.0	24.8		28.8	30.7	45.2	48.3	50.3	15 26.78		0.28	24.25	22 15 2.25		4.8
		Lalande 43871	39	45.1	47.1	50.2	5.6	7.6	9.6	11.8	13.7	29.0	32.4	34.6	22 9.70		0.20	24.24	22 21 45.26		3.3
	α	Lacertæ	40				36.7	39.0	41.5	44.0	46.4	4.9	8.7	11.3	26 51.56		10.22	24.24	22 26 17.10		3.3
		Lacaille 9196	41	55.0	57.1	0.1	15.6	17.4	19.7	21.9	23.7	38.9	41.9	44.3	32 19.60		0.29	24.23	22 31 55.08		5.0
		B. A. C. 7941	42	37.9	46.6	1.6	16.5	25.8	36.0	46.6	55.9	9.4	25.5	35.8	39 36.15		0.81	24.23	22 39 11.11		4.0
		O. Arg. S. 22516	43	14.7	16.4	19.0	32.5	34.2	36.1	37.7	39.6	53.1	55.7	57.6	51 36.05		0.24	24.21	22 51 11.60		4.5
	α	Pegasi	44	46.6	48.1	50.7	3.1	4.6	6.3	8.0	9.5	21.8	24.5	26.1	59 6.30		0.18	24.21	22 58 41.91		3.7
		*+36° 11′	45	6.7	8.5	11.5						58.9	2.1	4.1	4 35.30	−	0.18	24.21	23 4 10.91		3.7
		Weisse (2) 34	46	49.9	52.2	54.3	56.2	59.6		14.1	17.3	19.3			4 25.36	+	11.13	24.21	23 4 12.28		3.7
		Weisse 185	47	23.9	25.4	27.9	40.2	41.7	43.3	45.0	46.6	58.9	1.5	2.0	11 43.31	−	0.21	24.20	23 11 18.90		4.1
		*+36° 50′	48	51.8	53.6	56.7	11.7	13.6	15.7	17.8	19.5	34.5	37.7	39.7	15 15.66		0.19	24.20	23 14 51.27		3.6
		*+66° 16′	49	7.8	11.6	17.4	47.4	51.0	55.4	59.3	3.1	32.8	39.0	43.2	20 55.27		0.34	24.20	23 20 30.73		4.0
		*+15° 12′	50	21.9	23.4	25.8	38.3	39.8	41.6	43.5	45.0	57.2	59.9	1.5	25 41.63	−	0.18	−24.19	23 25 17.26	−	3.8

CORRECTIONS, &c.

Date.		Error of clock.	Hourly rate.	n	c
1877.	h.	s.	s.	s.	s.

		OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension	Reduction to 1877.0.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
7.															m. s.	s.	s.	h. m. s.	s.
.26	ι	Piscium . . .	1	46.6	48.1	50.6	2.5	4.1	5.9	7.5	9.0	20.9	23.3	25.1	34 5.78	− 0.19	−24.18	23 33 41.41	− 3.96
.	77	Pegasi	2	15.6	17.2	19.7	31.9	33.4	35.0	36.7	38.4	50.4	52.9	54.7	37 35.08	0.18	24.18	23 37 10.72	3.90
29	ζ	Aquilæ. . . .	3	51.1	52.7	55.3	7.5	9.1	10.9	12.6	14.2	26.4	29.0	30.6	0 10.85	− 0.18	22.65	18 59 48.02	2.64
		*−19° 18′ . . .	4	14.9	16.8	19.4	. .	. .	. .	. .	. .	. .	. .	. .	10 17.03	+ 18.07	22.64	19 10 12.46	3.49
		*−19° 16′ . . .	5	24.9	26.5	29.1	. .	. .	. .	. .	. .	. .	. .	. .	10 26.83	+ 18.07	22.64	19 10 22.26	3.49
		Gr. Cat. 1710 . .	6	. .	. .	. .	39.5	41.8	44.3	46.8	48.9	6.2	10.0	12.4	13 53.74	− 9.66	22.64	19 13 21.44	1.72
		Weisse (2) 556. .	7	19.5	21.5	24.5	39.4	41.5	43.4	45.5	47.7	2.2	5.4	7.7	19 43.48	0.19	22.63	19 19 20.66	2.12
		*+36° 58′ . . .	8	. .	. .	. .	36.0	37.8	39.8	41.9	43.7	58.8	1.9	3.9	20 47.97	8.29	22.63	19 20 17.05	2.13
		*+36° 56′ . . .	9	. .	. .	. .	7.0	9.0	11.3	13.3	15.1	30.0	33.2	35.3	21 19.28	8.29	22.63	19 20 48.36	2.13
		*−10° 12′ . . .	10	4.6	6.2	8.7	20.8	22.4	24.0	25.7	27.3	39.3	42.0	43.6	31 24.05	0.21	22.63	19 31 1.21	3.36
		O. Arg. S. 19933 .	11	49.3	50.9	53.8	7.3	8.9	10.9	12.6	14.5	27.8	30.7	32.4	39 10.83	0.25	22.62	19 38 47.96	3.90
		*+34° 59′ . . .	12	29.5	31.4	34.4	49.0	50.9	52.9	54.9	56.6	11.3	14.4	16.3	43 52.87	0.19	22.62	19 43 30.06	2.35
		Lalande 37785 .	13	. .	. .	. .	29.6	31.6	33.6	35.7	37.6	. .	. .	. .	44 33.62	0.18	22.62	19 44 10.82	− 2.34
	λ	Ursæ Minoris. .	14	. .	. .	. .	. .	. .	0.0	20.0	50.0	. .	. .	. .	48 25.33	13 34.07	22.61	. . . .	+ 47.21
		Lalande 38164 .	15	59.1	0.7	3.3	16.0	17.6	19.4	21.3	22.8	35.5	38.1	40.8	55 19.51	− 0.22	22.61	19 54 56.68	− 3.74
		*+33° 7′ . . .	16	. .	. .	. .	. .	. .	. .	47.4	50.4	52.8	54.9	57.5	2 52.60	− 41.02	22.60	20 1 48.98	2.50
		*+33° 5′ . . .	17	2.9	4.7	7.6	21.9	23.7	25.7	27.6	29.3	. .	. .	. .	2 17.92	+ 7.54	22.60	20 2 2.86	2.50
		Weisse 81 . . .	18	1.5	3.0	5.6	17.9	19.4	21.1	22.8	24.5	36.6	39.3	41.0	6 21.15	− 0.21	22.60	20 5 58.34	3.65
		*+36° 44′ . . .	19	13.4	15.1	17.8	. .	. .	. .	. .	. .	56.1	59.0	1.1	11 37.08	0.20	22.60	20 11 14.28	2.47
		*+36° 44′ . . .	20	. .	. .	. .	. .	. .	. .	. .	. .	31.9	35.0	37.0	12 34.63	21.75	22.60	20 11 50.28	2.47
		*+36° 44′ . . .	21	. .	. .	. .	. .	. .	. .	. .	. .	50.9	53.9	55.9	12 53.57	21.75	22.60	20 12 9.22	2.47
		*+36° 44′ . . .	22	. .	. .	. .	. .	. .	. .	16.0	19.2	21.2	23.3	25.8	13 21.10	42.86	22.60	20 12 15.64	2.48
		*+36° 44′ . . .	23	. .	. .	. .	48.0	49.9	51.9	54.0	55.9	. .	. .	. .	13 51.94	0.13	22.60	20 13 29.16	2.48
		*+36° 44′ . . .	24	. .	. .	. .	50.3	53.3	55.6	15.3	18.2	20.3	22.4	24.8	16 10.02	34.94	22.60	20 15 12.48	2.49
		B. A. C. 7053 . .	25	36.1	38.1	39.9	41.4	44.2	. .	47.8	50.5	52.1	53.9	55.8	23 15.98	0.30	22.59	20 22 53.09	3.82
	ο	Capricorni . . .	26	57.0	58.6	1.0	13.9	15.6	17.2	19.0	20.7	33.1	35.9	37.6	23 17.24	0.22	22.59	20 22 54.43	3.82
	η	Delphini . . .	27	14.3	15.8	18.2	30.5	32.1	33.8	35.4	36.9	49.2	51.9	53.6	28 33.79	0.18	22.59	20 28 11.02	3.13
	1	Aquarii . . .	28	13.6	15.1	17.6	29.5	31.0	32.7	34.5	35.9	47.7	50.4	52.0	33 32.73	0.19	22.59	20 33 9.96	3.43
		Weisse 924 . .	29	22.2	23.8	26.2	38.0	39.5	41.3	42.9	44.3	56.4	58.8	0.5	37 41.26	0.19	22.58	20 37 18.49	3.45
		Weisse 1057 . .	30	20.9	23.2	24.9	36.7	38.2	40.0	41.7	43.2	55.0	57.7	59.2	42 40.06	0.19	22.58	20 42 17.29	3.40
	μ	Aquarii . . .	31	8.2	9.8	12.1	24.3	25.8	27.6	29.3	30.7	42.8	45.3	47.0	46 27.54	0.20	22.57	20 46 4.77	3.71
		B. A. C. 7255 (2d *)	32	38.1	39.6	42.1	54.0	55.6	57.3	59.0	0.4	12.5	14.9	16.5	49 57.27	0.19	22.57	20 49 34.51	3.42
		*+37° 10′ . . .	33	6.3	8.0	11.2	26.1	28.0	30.1	32.3	34.0	49.0	52.3	54.2	56 30.14	0.20	22.57	20 56 7.37	2.77
		Lacaille 8699 . .	34	42.1	43.9	47.1	2.0	4.0	5.9	8.1	10.0	25.0	28.0	30.1	2 6.02	− 0.27	22.57	21 1 43.18	4.70
		Lacaille 8737 . .	35	22.5	24.2	27.4	. .	. .	. .	. .	. .	. .	. .	. .	7 24.70	+ 22.57	22.56	21 7 24.71	4.92
	β	Aquarii . . .	36	12.4	13.8	16.4	28.3	29.8	31.6	33.1	34.5	. .	. .	. .	25 24.99	+ 6.32	22.55	21 25 8.76	3.79
	ξ	Aquarii . . .	37	19.4	20.9	23.4	35.4	37.0	38.8	40.4	41.9	53.9	56.4	58.1	31 38.69	− 0.20	22.55	21 31 15.94	3.87
	α	Aquarii . . .	38	35.3	36.9	39.3	51.2	52.8	54.5	56.2	57.8	9.6	12.1	13.6	59 54.48	0.19	22.53	21 59 31.76	3.79
		*+71° 44′ . . .	39	17.8	22.6	30.4	8.8	13.6	18.9	24.3	28.9	7.2	15.2	20.3	5 18.91	0.42	22.52	22 4 55.97	2.74
	45	Aquarii . . .	40	31.7	33.3	35.8	48.2	49.7	51.5	53.2	54.6	7.0	9.5	11.2	12 51.43	0.21	22.52	22 12 28.70	4.11
		*+36° 37′ . . .	41	7.7	10.1	12.2	14.0	17.2	. .	32.3	35.7	37.5	39.7	42.0	16 54.84	0.28	22 51	22 16 32.05	3.32
		*+36° 41′ . . .	42	34.5	36.2	39.4	54.3	56.3	58.2	0.2	2.2	17.1	20.3	22.2	17 58.26	0.19	22.51	22 17 35.56	3.33
	37	Pegasi	43	52.1	53.7	56.2	8.2	9.7	11.4	13.0	14.5	26.3	28.9	30.4	24 11.31	0.19	22.51	22 23 48.61	3.79
	9	Lacertæ . . .	44	15.4	17.7	21.5	40.3	43.1	45.6	48.3	50.7	9.3	13.5	16.2	32 45.60	0.23	22.50	22 32 22.87	3.32
	ο	Pegasi	45	. .	. .	. .	21.7	23.5	25.5	27.2	28.9	42.5	45.3	47.2	36 32.72	7.56	22.50	22 36 2.66	3.52
0	ι	Piscium . . .	46	44.9	46.4	49.0	0.9	2.5	4.0	5.8	7.4	19.4	21.8	23.4	34 4.14	0.19	22.51	23 33 41.44	3.97
		*−32° 4′ . . .	47	. .	. .	. .	1.4	3.2	5.0	6.9	8.7	. .	. .	. .	44 5.04	0.23	22.51	23 43 42.30	4.64
	ω	Piscium . . .	48	. .	. .	. .	23.0	24.7	26.5	28.2	29.7	41.6	44.2	45.8	53 32.96	6.70	22.52	23 53 3.74	3.98
		B. A. C. 8355 (1st *)	49	15.5	20.0	24.2	27.7	34.2	. .	59.0	5.0	8.9	12.8	17.5	56 46.48	0.56	22.52	23 56 23.40	4.50
		B. A. C. 8355 (2d *)	50	2.7	6.1	12.1	40.7	44.5	48.6	52.7	56.4	24.7	50.8	34.6	56 48.54	− 0.39	−22.52	23 56 25.63	− 4.50

CORRECTIONS, &c.

Date.	Error of Clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Sept. 29, 20.9	− 22.57	+ 0.049	+ 0.06	− 0.19
30, 1.8	− 22.57	− 0.027	+ 0.03	− 0.19

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS.		Clock.	Observed Right Ascension.	Reducti to 1877.	
																Inst.				
														m. s.		s.	s.	h. m. s.		s.
1877. Sept. 30 Y.	Lalande 47298 .	1	25.6	27.3	30.4	45.3	47.2	49.3	51.5	53.2	8.0	11.1	13.1	1 49.27	−	0.22	−22.52	0 1 26.53	−	3.9
	Weisse 90 . . .	2	54.5	55.8	58.4	. .	. .	. .	. .	. .	28.7	31.2	32.7	7 13.55		0.20	22.52	0 6 50.83		4.0
	Weisse 112 . .	3	31.1	32.5	35.1	47.0	48.0	50.1	51.7	53.2	5.2	7.7	9.3	8 50.08		0.19	22.52	0 8 27.37		4.0
	*+44° 14' . . .	4	19.4	21.5	24.6	. .	. .	. .	. .	. .	7.0	10.6	12.7	14 45.97		0.25	22.53	0 14 23.19		4.0
	*+44° 12' . . .	5	57.3	59.3	2.5	19.5	21.5	24.0	26.4	28.2	44.9	47.9	50.7	16 23.84		0.24	22.53	0 16 1.07		4.0
	*+42° 37' . . .	6	41.2	43.0	46.2	. .	. .	. .	. .	. .	27.3	31.0	33.1	24 6.70		0.24	22.53	0 23 13.93		4.1
	*+42° 37' . . .	7	. .	. .	. .	5.1	7.1	9.3	11.6	13.8	. .	. .	. .	24 9.38		0.22	22.53	0 23 46.63		4.1
	Weisse 446 . .	8	44.8	46.3	48.7	0.5	2.2	3.9	5.6	7.0	19.1	21.6	23.1	29 3.89		0.19	22.53	0 28 41.17		4.0
	Weisse 664 . .	9	45.7	47.2	49.6	1.5	3.1	4.8	6.4	7.0	19.8	22.4	23.9	40 4.67	−	0.19	22.54	0 39 41.94		4.0
	*+3° 6' . . .	10	14.3	16.0	18.3	30.4	31.8	33.4	35.2	36.6	. .	. .	. .	43 27.00	+	6.30	22.54	0 43 10.76		4.0
	*+3° 3' . . .	11	. .	. .	. .	58.2	0.0	2.1	4.3	5.7	. .	. .	. .	44 2.06	−	0.18	22.54	0 43 39.34		4.0
	Lalande 1504 (1st *)	12	29.1	31.5	33.7	34.5	39.2	. .	55.8	59.1	1.0	3.2	5.7	48 17.28		0.31	22.54	0 47 54.43		4.1
	Lalande 1504 (2d *)	13	53.0	54.7	57.9	13.1	15.0	17.4	19.3	21.3	36.4	39.8	41.9	48 17.25		0.22	22.54	0 47 54.49		4.1
	*+36° 30' . . .	14	29.9	31.8	34.7	49.7	51.5	53.8	55.8	57.6	12.5	15.6	17.7	51 53.69		0.22	22.54	0 51 30.93		4.1
	Lalande 1627 . .	15	. .	. .	. .	42.8	45.8	47.8	1.5	4.5	6.4	8.6	10 9	52 58.54		34.88	22.54	0 52 1.12		4.1
	*−24° 46' . . .	16	3.2	5.3	7.7	21.2	22.8	24.4	25.8	27.6	41.3	44.1	45.8	57 24.47		0.22	22.55	0 57 1.70		4.2
	Weisse 137 . .	17	58.8	0.3	2.9	15.1	16.8	18.4	20.1	21.7	33.8	36.5	38.0	11 18.40		0.19	22.55	1 10 56.66		4.0
	Weisse 165 . .	18	49.5	51.2	53.6	6.0	7.7	9.3	10.9	12.5	24.9	27.3	29.0	13 9.26		0.19	22.55	1 12 46.52		4.0
	Weisse 188 (2d *).	19	51.5	53.0	55.6	7.8	9.5	11.1	13.0	14.5	26.7	29.2	31.9	14 11.25		0.19	22.55	1 13 48.51		4.0
	44 Ceti.	20	50.0	0.5	3.0	15.0	16.5	18.2	19.7	21.4	33.5	36.0	37.6	18 18.22		0.20	22.56	1 17 55.46		4.0
	Polaris	21	. .	. .	. .	. .	. .	. .	. .	. .	44.0	30.0	43.0	27 19.00		12 24.79	22.56	. . . .		49.4
	o Piscium . . .	22	1.5	3.1	5.5	17.5	19.1	20.9	23.6	24.1	35.9	38.5	40.1	39 20.89		0.19	22.57	1 38 58.13		4.0
	B. A. C. 563 . .	23	32.7	34.7	37.8	53.0	55.0	57.0	59.1	1.1	16.6	19.9	22.0	44 57.17		0.27	22.57	1 44 34.33		4.3
	B. A. C. 578 . .	24	7.7	9.6	12.9	28.2	30.2	32.4	34.5	36.5	51.8	55.2	57.2	48 32.38		0.27	22.57	1 48 9.54		4.2
	B. A. C. 613 . .	25	21.2	23.1	26.5	42.8	44.6	46.8	49.0	51.0	6.9	10.2	12.5	53 46.78		0.28	22.57	1 53 23.93		4.3
	O. Arg. S. 1259 .	26	16.8	18.3	21.0	34.1	35.8	37.8	39.6	41.2	54.3	57.0	58.9	57 37.71		0.22	22.57	1 57 14.92		4.0
	*+39° 0' . . .	27	36.8	38.8	42.0	57.2	59.4	1.5	3.7	5.6	20.9	24.0	26.3	2 1.47		0.22	22.58	2 1 38.67		4.4
	*+55° 18' . . .	28	34.9	38.1	40.9	43.6	48.4	. .	34.3	38.3	41.1	44.2	47.7	9 41.15		0.42	22.58	2 9 18.15		5.0
	*+55° 18' . . .	29	16.5	19.0	23.5	44.2	46.8	49.8	52.6	55.5	16.2	20.7	23.4	9 49.84		0.29	22.58	2 9 26.97		5.0
	*+55° 18' . . .	30	13.5	16.1	20.4	41.3	44.0	46.9	49.8	52.4	13.8	18.2	20.8	12 47.02		0.29	22.58	2 12 24.15		5.0
	i Persei	31	41.9	44.7	49.1	9.8	12.5	15.6	18.5	21.0	41.8	46.5	49.2	14 15.51		0.29	22.58	2 13 52.64		5.0
	Weisse 305 . .	32	58.2	0.2	1.9	3.5	6.2	. .	7.3	9.7	11.4	13.0	15.1	20 36.65		0.26	22.58	2 20 13.81		3.9
	*+ 9° 59' . . .	33	19.7	21.2	23.8	36.0	37.5	39.2	40.8	42.3	54.5	57.0	58.7	20 39.15		0.19	22.58	2 20 16.38		3.9
	*+61° 11' . . .	34	. .	. .	. .	3.8	8.9	12.1	35.1	40.7	44.0	47.6	51.3	24 30.44		58.14	22.59	2 23 9.71		5.5
	Lalande 4761 . .	35	25.2	26.9	29.9	44.7	46.7	48.9	50.7	52.5	7.5	10.6	13.7	28 48.85		0.22	22.59	2 28 26.04		4.3
	Weisse (2) 718 . .	36	. .	. .	. .	58.1	1.3	3.3	15.9	16.8	20.5	22.6	25.1	32 12.95		32.46	22.59	2 31 17.90		4.2
	γ Ceti	37	3.3	4.7	7.2	19.2	20.7	22.4	24.0	25.5	37.4	39.9	41.6	37 22.35		0.19	22.59	2 36 59.57		3.9
	Weisse 702 . .	38	10.3	11.8	14.3	26.7	28.1	29.8	31.5	33.0	45.3	48.0	49.5	42 29.85		0.19	22.59	2 42 7.07		3.9
	Weisse 790 . .	39	17.2	19.9	21.2	33.5	35.0	36.7	38.3	39.7	51.9	54.3	56.1	47 36.71		0.19	22.60	2 47 13.92		3.9
	*+38° 26' . . .	40	6.2	8.3	11.3	26.5	28.4	30.5	32.6	34.6	49.8	53.0	55.1	54 30.57		0.22	22.60	2 54 7.75		4.4
	*+37° 6' . . .	41	17.5	19.4	22.5	37.6	39.4	41.2	43.4	45.3	0.3	3.7	5.6	58 41.45		0.22	22.60	2 58 18.63		4.4
	*+38° 28' . . .	42	55.5	57.3	0.5	15.6	17.6	19.8	21.8	23.9	39.1	42.5	44.2	6 19.80		0.22	22.60	3 5 56.98		4.4
	ζ Arietis	43	56.5	58.0	0.7	13.5	15.1	16.8	18.6	20.2	33.0	35.7	37.4	8 16.86		0.19	22.61	3 7 54.06		4.
	Weisse (2) 209 .	44	13.6	15.8	17.8	31.0	32.6	34.6	36.5	38.0	51.0	53.7	55.4	11 34.50		0.19	22.61	3 11 11.70		4.
	Weisse 251 . .	45	19.1	20.6	23.2	35.2	36.8	38.4	40.0	41.6	53.8	56.3	58.0	15 38.45		0.19	22.61	3 15 15.65		3.
	Weisse (2) 393 .	46	8.8	10.3	12.9	25.3	27.0	28.8	30.4	32.0	54 7	57.5	59.2	20 28.81		0.19	22.61	3 20 6.01		3.
	O. Arg. S. 2302 .	47	51.4	53.5	56.2	8.8	10.4	12.0	13.8	15.5	27.9	30.5	32.2	21 12.02		0.31	22.61	3 23 49.20		3.
	*+31° 36' . . .	48	26.2	28.0	30.8	44.7	46.6	48.5	50.5	52.3	6.2	9.3	11.0	27 48.55		0.20	22.62	3 27 25.73		4.
	*+31° 37' . . .	49	58.2	.	2.0	17.0	18.6	20.8	22.5	24.3	38.0	. .	43.0	29 20.49		0.20	22.62	3 28 57.67		4.
	12 Tauri	50	34.1	35.7	38.1	50.1	52.6	53.3	55.0	56.[illegible]	8.4	10.9	12.6	33 53.39	−	0.19	−22.62	3 32 30.58	−	3.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1870. h.	s.	s.	s.	s.

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS.	Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.	
'77.														m. s.		s.	s.	h. m. s.		s.
t. 30	*+23° 14' . . .	1	23.2	24.8	27.6	40.6	42.3	44.1	45.9	47.6	0.4	3.2	5.0	39 44.06	−	0.19	−22.62	3 39 21.25	−	4.04
f.	Radcliffe 1084. .	2	50.8	52.7	56.0	11.6	13.6	15.8	18.3	20.2	5.7	39.0	41.1	44 15.89		0.23	22.62	3 43 53.04		4.51
	Lalande 7206 . .	3	37.3	39.0	42.0	56.4	58.4	0.4	2.5	4.3	18.7	21.9	23.8	49 0.43	−	0.21	22.62	3 48 37.60		4.31
	γ^1 Eridani. . . .	4	24.2	25.6	28.2	40.5	42.0	43.8	45.3	47.0	. .	. .	. .	52 37.08	+	6.47	22.63	3 52 20.92		3.47
t. 6	δ Aquilæ. . . .	5	. .	. .	. .	58.5	1.0	2.7	13.6	16.1	17.8	19.3	21.2	20 11.28	−	28.05	22.65	19 19 20.55		2.89
	*+38° 56' . . .	6	. .	. .	. .	42.2	44.4	46.4	48.5	50.7	5.6	9.0	11.2	30 54.75		8.44	22.68	19 30 23.63		1.96
	*+38° 58' . . .	7	0.4	2.8	4.9	6.8	10.5	. .	27.8	30.9	33.1	35.0	37.6	30 48.98		0.21	22.68	19 30 26.09		1.96
	*+38° 58' . . .	8	54.9	56.8	59.9	15.4	17.6	19.7	21.8	23.9	39.0	42.5	44.3	32 19.62		0.12	22.68	19 31 56.82		1.95
	γ Aquilæ . . .	9	30.9	32.5	35.1	47.1	48.7	50.4	52.0	53.6	5.6	8.3	9.9	40 50.37		0.14	22.68	19 40 27.55	−	2.82
	B. A. C. 6808 (2d *)	10	57.7	1.9	9.3	42.4	46.5	51.:	56.0	0.0	34.0	40.9	45.1	44 51.39		0.16	22.67	19 44 28.56	+	0.02
	ε Draconis . . .	11	1.5	6.6	13.4	48.5	52.9	58.0	2.6	7.0	41.9	49.3	54.0	48 57.79		0.16	22.67	19 48 34.96	−	0.06
	Weisse 1259 . .	12	. .	. .	. .	54.5	55.7	57.3	59.0	0.5	12.8	15.9	17.4	52 4.14		6.88	22.67	19 51 34.59	−	3.47
	λ Ursæ Minoris. .	13	. .	. .	. .	. .	. .	. .	. .	. .	20.0	34.0	10.0	2 21.33		15 39.46	22.67	. . . .	+	56.68
	α^2 Capricorni. .	14	20.7	22.0	24.7	36.9	38.4	40.1	41.8	43.4	55.5	58.3	59.9	11 40.15		0.19	22.67	20 11 17.29	−	3.54
	25 Vulpeculæ. . .	15	51.0	52.5	55.1	8.2	9.9	11.7	13.5	15.1	28.2	29.8	32.6	17 11.60		0.13	22.67	20 16 48.80		2.69
	B. A. C. 7036 . .	16	56.2	58.1	1.1	16.2	18.0	19.9	21.8	23.9	38.7	41.7	43.7	21 19.94		0.28	22.67	20 20 56.99		4.34
	B. A. C. 7080 . .	17	46.7	48.2	50.9	3.0	4.5	6.2	7.9	9.5	21.5	24.2	25.9	26 6.23		0.18	22.67	20 25 43.38		3.54
	B. A. C. 7112 . .	18	50.8	53.0	56.6	13.8	16.0	18.6	20.6	23.0	40.0	43.5	46.0	30 18.35		0.12	22.67	20 29 55.56		2.15
	1 Aquarii . . .	19	13.6	15.1	17.6	29.5	31.1	32.7	34.3	35.8	47.7	50.2	51.8	33 32.67		0.16	22.67	20 33 9.84		3.33
	*+34° 56' . . .	20	23.3	24.9	27.9	. .	. .	. .	. .	. .	4.7	7.9	10.0	37 46.45		0.13	22.67	20 37 23.65		2.56
	Lalande 40043. .	21	35.3	37.0	40.0	. .	. .	. .	. .	. .	17.0	20.0	22.1	37 58.57		0.13	22.67	20 37 35.77		2.56
	4 Cephei	22	15.2	18.8	25.2	54.7	58.5	2.7	6.9	10.2	40.0	46.3	50.2	42 2.61		0.15	22.67	20 41 39.79		1.22
	*+38° 50' . . .	23	. .	. .	. .	52.0	54.2	56.1	58.3	0.2	15.4	18.7	21.0	45 4.49		8.43	22.67	20 44 33.39		2.51
	*−19° 30' . . .	24	. .	. .	. .	6.3	7.9	9.7	11.9	13.6	. .	. .	. .	49 9.88		0.20	22.67	20 48 47.01		3.90
	*−19° 30' . . .	25	. .	. .	. .	28.5	30.2	31.9	33.6	35.2	47.9	50.5	52.4	49 38.78		7.08	22.67	20 49 9.03		3.90
	f^2 Cygni	26	19.2	21.5	25.0	42.5	44.8	47.3	49.5	51.8	9.4	13.2	15.7	2 47.26		0.12	22.67	21 2 24.47		2.42
	*+45° 48' . . .	27	18.2	20.6	24.4	42.7	44.6	47.3	49.7	52.0	10.2	13.9	16.5	15 47.28		0.12	22.67	21 15 24.49		2.49
	Lalande 41624. .	28	. .	. .	. .	37.3	40.4	42.4	56.4	59.7	1.6	3.9	6.1	18 53.48		35.49	22.67	21 17 55.32		2.78
	*+38° 6' . . .	29	. .	. .	. .	21.3	23.1	25.3	27.4	29.5	. .	. .	. .	18 25.32		0.11	22.67	21 18 2.54		2.78
	*−23° 46' . . .	30	57.5	59.0	1.9	. .	. .	. .	. .	. .	35.0	37.6	39.3	23 18.38		0.23	22.67	21 22 55.48		4.17
	*−25° 45' . . .	31	44.0	45.4	48.1	1.6	3.2	5.1	7.0	8.6	21.9	24.7	26.5	27 5.10		0.23	22.67	21 26 42.20		4.25
	5 Pegasi	32	6.0	7.7	10.3	22.7	24.4	26.3	27.7	29.4	42.2	44.9	46.5	32 26.19		0.13	22.67	21 32 3.39		3.25
	κ Capricorni. . .	33	53.9	55.4	58.2	10.8	12.5	14.2	15.9	17.5	30.2	32.9	34.6	36 14.19		0.21	22.67	21 35 51.31		4.09
	*+38° 57' . . .	34	23.0	24.6	28.1	43.3	45.3	47.3	49.5	51.5	6.8	10.1	12.0	45 47.41		0.12	22.67	21 45 24.62		2.98
	Lacaille 8981 . .	35	30.8	32.6	35.4	49.0	51.8	52.7	54.7	56.4	10.0	12.7	14.6	52 52.79		0.25	22.67	21 52 29.87		4.47
	29 Aquarii (1st *) .	36	. .	. .	. .	. .	7.8	9.6	11.2	12.9	. .	. .	. .	56 10.38		1.03	22.67	21 55 46.68		4.10
	29 Aquarii (2d *) .	37	. .	. .	. .	25.5	28.1	29.9	41.4	44.0	45.6	47.3	49.3	56 38.88		29.41	22.67	21 55 46.80		4.10
	O. Arg. N. 23385 .	38	21.8	24.2	28.2	48.3	50.8	53.6	56.4	59.0	18.5	22.7	25.6	1 53.55		0.12	22.67	22 1 30.76		2.87
	*+71° 44' . . .	39	17.7	22.2	30.3	8.4	13.5	19.1	24.3	29.0	7.2	14.6	19.3	5 18.69		0.18	22.67	22 4 55.84		2.45
	η Aquarii. . . .	40	. .	. .	. .	43.8	46.4	48.0	59.0	1.5	3.0	4.8	6.6	29 56.64		28.02	22.67	22 29 5.95		3.85
	o Pegasi	41	3.7	5.2	8.1	21.7	23.3	25.2	27.1	28.9	42.4	45.4	47.2	36 25.29		0.12	22.67	22 36 2.50		3.47
	*−14° 16' . . .	42	. .	. .	. .	50.3	51.9	53.7	55.2	56.9	9.2	11.8	13.6	39 0.33		6.87	22.67	22 38 30.79		4.14
	Weisse (2) 1012 .	43	27.5	29.2	32.5	47.8	49.9	52.1	54.0	55.6	11.4	14.7	16.7	44 51.95		0.12	22.67	22 44 29.16		3.43
	O. Arg. S. 22514 .	44	11.4	12.9	15.8	29.3	31.2	32.8	34.6	36.4	49.7	52.7	54.3	51 32.83		0.24	22.67	22 51 9.92		4.48
	O. Arg. S. 22516 .	45	52.2	54.2	56.1	57.8	0.6	. .	8.2	11.0	12.7	14.6	16.9	51 34.43		0.32	22.67	22 51 11.44		4.48
	*−6° 37' . . .	46	18.9	40.4	42.8	54.9	56.4	57.9	59.8	1.2	13.3	15.7	17.5	55 58.07		0.17	22.67	22 55 35.23		4.02
	α Pegasi	47	. .	. .	. .	1.4	3.0	4.7	6.3	8.0	20.1	22.8	24.5	59 11.35		6.83	22.67	22 58 41.85		3.74
	Lalande 45323. .	48	11.9	13.7	16.9	32.0	33.9	36.1	38.2	40.3	55.3	58.5	0.4	3 36.11		0.12	22.66	23 3 13.33		3.57
	7 Andromedæ . .	49	52.8	55.2	58.8	16.8	19.2	21.7	24.2	26.3	44.6	48.5	50.9	7 21.73		0.12	22.66	23 6 58.95		3.57
	Lalande 45588. .	50	. .	. .	. .	25.9	27.9	30.3	32.3	34.2	49.0	52.0	54.1	11 38.21	−	8.26	−22.66	23 11 7.29	−	3.63

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Oct. 6, 21.4	− 22.67	+ 0.003	+ 0.11	− 0.16

Date and observer.		OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0
1877.															m. s.	s.	s.	h. m. s.	s.
Oct. 6		*+54° 11' . . .	1	49.1	51.6	54.7	16.1	19.0	21.9	24.7	27.1	47.6	52.0	54.7	21 21.77	− 0.12	−22.66	23 20 58.99	− 3.7
Y.		Radcliffe 6079. .	2	4.3	6.6	10.8	31.4	33.5	36.9	39.6	42.1	2.9	6.8	9.8	21 36.79	0.12	22.66	23 21 14.01	3.7
		*+35° 6' . . .	3	..	..	..	..	..	..	30.5	33.6	35.5	37.4	39.9	30 35.38	41.92	22.66	23 29 30.80	3.7
	ι	Piscium . . .	4	45.0	46.6	49.2	1.0	2.6	4.3	5.9	7.5	19.3	21.7	23.5	34 4.24	0.15	22.66	23 33 41.43	3.9
9	δ	Aquilæ. . . .	5	5.0	6.6	9.0	40.9	42.4	44.0	45.6	47.1	59.0	1.5	3.1	19 44.02	0.16	23.29	19 19 20.57	2.8
		*+38° 56' . . .	6	58.6	0.8	3.2	5.0	8.5	..	25.9	29.0	31.0	33.4	35.8	30 47.12	0.21	23.29	19 30 23.62	1.8
		*+38° 58' . . .	7	25.0	27.3	30.6	45.4	47.3	49.4	51.8	53.7	8.7	11.7	14.1	30 49.55	0.12	23.29	19 30 26.14	1.9
		*+38° 32' . . .	8	..	..	..	8.2	10.1	12.4	14.4	16.2	31.7	35.0	37.0	34 20.62	8.39	23.29	19 33 48.94	1.9
	γ	Aquilæ. . . .	9	31.5	33.2	35.7	47.7	49.3	51.0	52.7	54.2	6.4	8.9	10.6	40 51.02	0.14	23.29	19 40 27.59	2.7
		*−38° 3' . . .	10	29.9	31.5	34.6	50.0	52.0	54.0	56.0	57.9	..	..	..	49 45.74	0.29	23.28	19 49 13.94	4.1
		*−37° 59' . . .	11	..	..	..	25.5	28.6	30.6	44.9	48.0	49.8	52.0	54.5	50 41.74	35.63	23.28	19 49 42.83	4.1
		Lalande 38202 (1st*)	12	..	..	..	52.9	55.9	57.9	12.0	15.2	17.1	19.3	21.7	55 9.00	35.36	23.28	19 54 10.36	2.0
		Lalande 38202 (2d *)	13	..	..	..	30.1	32.0	34.1	36.1	37.9	..	..	..	54 34.04	0.11	23.28	19 54 10.65	2.0
		*+30° 54' . . .	14	23.3	25.2	28.0	42.0	43.8	45.7	47.7	49.6	3.3	6.2	8.2	59 45.73	0.12	23.28	19 59 22.33	2.3
		*−9° 15' . . .	15	57.3	58.7	1.3	13.4	14.9	16.6	18.3	19.8	31.8	34.3	36.1	4 16.59	0.18	23.28	20 3 53.13	3.3
		*−14° 3' . . .	16	..	..	..	43.9	45.5	47.1	49.0	50.5	..	..	..	5 47.20	0.18	23.28	20 5 23.74	3.4
		*−14° 3' . . .	17	..	..	..	7.7	9.6	11.6	13.9	15.7	27.6	29.9	32.0	6 18.50	6.86	23.28	20 5 48.36	3.5
		O. Arg. S. 20388 .	18	48.3	49.9	52.6	5.2	6.8	8.6	10.2	11.9	24.5	27.1	28.7	12 8.53	0.20	23.28	20 11 45.05	3.6
		O. Arg. S. 20439 .	19	28.2	29.8	32.5	46.4	48.0	50.0	51.8	53.5	7.3	10.3	12.0	15 49.98	0.25	23.28	20 15 26.45	4.0
	π	Capricorni. . .	20	23.7	25.3	27.9	40.5	41.9	43.8	45.5	47.0	59.7	2.3	4.0	20 43.78	0.21	23.28	20 20 20.29	3.6
		Lacaille 8475 (2d *)	21	38.7	40.7	43.5	59.8	1.8	4.0	6.2	8.4	24.1	27.4	29.4	26 4.00	0.31	23.28	20 25 40.41	4.5
	27	Vulpeculæ. . .	22	54.9	56.5	59.2	12.4	14.3	16.1	18.0	19.6	32.8	35.7	37.5	32 16.09	0.12	23.28	20 31 52.69	2.6
		*+34° 57' . . .	23	24.3	25.7	28.6	..	..	..	..	..	5.7	8.8	10.8	37 47.32	0.13	23.28	20 37 23.91	2.5
		Lalande 40043. .	24	35.9	37.8	40.7	..	..	..	..	..	17.6	20.8	22.7	37 59.25	0.13	23.28	20 37 35.84	2.5
	4	Cephei	25	15.8	19.5	26.0	55.4	59.4	3.0	7.5	11.2	40.7	47.3	51.2	42 3.36	0.15	23.28	20 41 39.93	1.0
		*−19° 30 . . .	26	49.5	51.6	54.3	7.0	8.6	10.3	12.1	13.6	26.3	28.9	30.6	49 10.25	0.21	23.28	20 48 46.76	3.8
		*−19° 30' . . .	27	..	..	..	48.2	51.0	52.6	4.5	7.2	8.9	10.5	13.7	50 2.08	29.76	23.28	20 49 9.04	3.8
		Radcliffe 5050. .	28	19.7	21.6	25.0	41.7	44.0	46.1	48.3	50.5	7.0	10.6	12.8	54 46.12	0.12	23.27	20 54 22.73	2.3
		* 16° 4' . . .	29	15.2	16.6	19.1	31.6	33.2	34.9	36.6	38.2	50.5	53.3	54.9	1 34.92	0.20	23.27	21 1 11.45	3.8
		Lacaille 8737 . .	30	23.0	24.9	28.3	43.8	45.7	48.1	50.4	52.5	8.3	11.7	13.8	7 48.23	− 0.31	23.27	21 7 24.65	4.5
		Weisse 239 . .	31	44.3	45.9	48.4	0.7	2.3	4.1	5.7	7.2	..	..	..	12 57.32	+ 6.47	23.27	21 12 40.52	3.8
		Weisse 258 . .	32	26.3	27.7	30.4	42.5	44.1	45.8	47.5	49.1	1.3	3.9	5.6	13 45.84	− 0.19	23.27	21 13 22.38	3.8
		Lalande 42031. .	33	37.7	39.4	42.6	57.9	59.9	1.9	4.1	5.9	..	..	..	28 53.68	+ 8.09	23.27	21 28 38.50	2.8
		*+38° 0' . . .	34	..	..	..	..	32.6	34.3	48.9	52.1	54.1	56.4	58.3	29 48.10	− 34.60	23.27	21 28 50.23	2.8
	μ	Capricorni. . .	35	43.1	44.6	47.0	59.4	1.1	..	4.5	6.1	18.3	20.9	22.5	47 2.75	0.20	23.27	21 46 39.28	3.9
		Lacaille 8981 . .	36	31.5	33.1	35.9	49.7	51.5	53.4	55.2	57.0	10.7	13.4	15.2	52 53.33	0.25	23.27	21 52 29.81	4.4
		O. Arg. N 23385 .	37	22.4	24.8	28.9	48.5	51.3	54.2	56.9	59.3	18.9	23.2	25.9	1 54.02	0.12	23.26	22 1 30.64	2.8
		*+71° 44' . . .	38	18.1	23.2	30.7	8.8	13.7	18.9	24.4	29.5	7.6	15.5	20.4	5 19.16	0.18	23.26	22 4 55.72	2.3
	δ	Aquarii . . .	39	28.7	30.2	32.6	44.8	46.3	47.9	49.5	51.1	3.2	5.7	7.3	10 47.94	− 0.18	23.26	22 10 24.50	3.9
		*+36° 37' . . .	40	8.7	10.7	12.9	14.6	18.1	..	..	..	..	..	..	17 13.00	+ 42.11	23.26	22 17 31.85	3.2
		*+36° 41' . . .	41	35.2	37.1	40.1	55.4	56.8	59.0	1.1	2.9	17.7	20.8	23.0	17 59.01	− 0.12	23.26	22 17 35.63	3.1
		*+6° 35 . . .	42	50.6	52.3	54.7	6.8	8.5	10.1	11.9	13.5	25.0	27.3	29.0	25 9.97	0.15	23.26	22 24 46.56	3.6
		O. Arg. S. 22282 .	43	0.2	1.5	4.2	17.1	18.9	20.6	21.4	21.0	37.0	39.6	41.4	31 20.54	0.22	23.26	22 30 57.06	4.3
		*−14° 18' . . .	44	..	..	..	..	..	..	18.8	21.4	22.8	24.5	26.6	39 22.82	− 35.48	23.26	22 38 24.08	4.1
		*−14° 16' . . .	45	34.6	36.1	38.6	50.9	52.4	54.2	55.8	57.4	..	..	..	38 47.50	+ 6.50	23.26	22 38 30.74	4.1
		B. A. C. 7957 . .	46	5.4	7.2	10.5	26.1	28.2	30.4	32.6	34.5	49.6	53.1	55.4	44 30.27	− 0.30	23.26	22 44 6.71	4.
		Lalande 9284 . .	47	12.9	14.9	18.0	33.9	35.8	38.1	40.2	42.2	57.8	0.9	3.2	45 37.99	0.30	23.26	22 45 14.43	4.
		Lacaille 9315 (1st *)	48	..	..	..	29.8	31.4	33.3	35.0	36.8	..	..	..	51 33.26	0.22	23.26	22 51 9.78	4.
		O. Arg. S. 22514 .	49	12.0	13.7	16.5	..	..	..	..	..	50.4	53.0	54.9	51 33.42	0.24	23.26	22 51 9.92	4.
		O. Arg. S. 22516 .	50	53.0	54.8	56.6	58.4	1.2	..	8.9	11.8	13.5	15.4	17.6	51 35.12	− 0.31	−23.26	22 51 11.55	− 4.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Oct. 9, 21.4	− 23.27	+ 0.009	+ 0.11	− 0.016

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.			Observed Right Ascension.	Reduction to 1877.0.	
			I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.		Inst.	Clock.			
7.														m. s.		s.	s.	h. m. s.		s.
9	56 Pegasi	1	13.3	15.0	17.8	30.9	32.6	34.5	36.3	37.9	51.0	53.9	55.6	1 34.44	−	0.13	−23.26	23 1 11.05	−	3.63
	7 Andromedæ	2	53.2	55.5	59.3	17.2	19.6	22.1	24.6	26.9	45.1	49.0	51.2	7 22.15		0.12	23.25	23 6 58.78		3.55
	O. Arg. S. 22721	3	11.8	13.4	15.9	. .	. .	. .	.	.	48.6	51.3	53.0	10 32.33		0.23	23.25	23 10 8.85		4.35
	O. Arg. S. 22732	4	25.7	27.3	29.9	. .	. .	. .	.	.	2.5	5.2	6.9	10 46.25	−	0.23	23.25	23 10 22.77		4.35
	*−5° 24′	5	52.3	53.6	56.0	8.1	9.7	11.3	13.0	14.5	. .	. .	. .	15 4.81	+	6.34	23.25	23 14 47.90		4.03
	B. A. C. 8134	6	. .	. .	. .	25.4	27.0	28.6	30.3	31.9	44.0	46.5	47.9	15 35.20	−	6.67	23.25	23 15 5.28		4.03
	Radcliffe 6081	7	21.1	23.5	27.6	48.4	51.0	53.8	56.7	59.2	19.8	23.9	26.6	21 53.78		0.12	23.25	23 21 30.41		3.72
	*+54° 8′	8	49.5	52.6	55.5	58.2	2.5	. .	4	49.7	5 .4	55.1	58.5	21 53.92		0.24	23.25	23 21 30.43		3.71
	Weisse (2) 639	9	2.0	3.6	6.9	. .	. .	. .		. .	43.6	47.0	48.7	31 25.30		0.13	23.25	23 31 1.92		3.75
	Weisse (2) 658	10	26.2	28.2	30.9	. .	. .	. .	. .	. .	.9	11.1	13.0	31 49.55		0.13	23.25	23 31 26.17		3.75
	B. A. C. 8252	11	2.6	5.0	9.0	28.6	31.2	33.8	36.4	39.0	58.7	2.8	5.2	37 33.85		0.12	23.25	23 37 10.48		3.87
	Groombridge 4142	12	54.6	58.0	3.5	30.0	33.3	36.9	40.8	44.3	10.4	15.8	19.5	42 37.91		0.14	23.25	23 42 13.62		4.16
	Lalande 46873	13	53.7	54.5	58.6	13.9	15.7	17.8	19.9	21.9	36.7	39.9	41.8	49 17.67		0.12	23.25	23 48 54.30		3.87
	*+28° 21′	14	35.0	36.7	39.7	53.0	54.9	56.9	58.7	0.3	13.8	16.8	18.5	0 56.76		0.12	23.25	0 0 33.39		3.82
	Lalande 89	15	30.6	32.6	35.5	50.5	52.4	54.5	56.4	58.4	13.2	16.5	18.4	6 54.45	−	0.12	23.25	0 6 31.08		3.98
	*+0° 5′	16	39.6	41.5	44.0	55.9	57.5	59.0	0.7	2.2	.	. .	. .	10 52.55	+	6.32	23.25	0 10 35.62		4.07
	Radcliffe 65	17	59.4	1.4	5.1	21.8	23.5	26.0	28.5	30.4	46.7	50.4	52.7	14 25.99	−	0.12	23.24	0 14 2.63		4.10
	Radcliffe 73	18	. .	. .	. .	3.0	5.4	7.8	10.0	12.2	.	. .	. .	15 7.68		0.11	23.24	0 14 44.33		4.10
	Weisse 358	19	11.0	12.6	15.0	27.1	28.5	30.2	31.9	33.6	4 7	48.0	49.6	23 30.29		0.15	23.24	0 23 6.90		4.05
	Weisse 446	20	45.5	47.0	49.5	1.4	2.8	4.5	6.2	7.8	19.7	22.2	23.9	29 4.59		0.15	23.24	0 28 41.20		4.07
	*+4° 3′	21	8.3	9.7	11.9	24.2	25.7	27.4	28.9	30.6	41.9	45.0	46.7	36 27.30	−	0.15	23.24	0 36 3.91		4.08
	Weisse 664	22	46.5	48.0	50.5	. .	. .	. .	. .	. .	.	.	. .	39 48.33	+	17.11	23.24	0 39 42.20		4.12
	*+3° 3′	23	15.7	17.0	19.3	31.3	32.9	34.6	36.2	37.8	49.5	2.0	53.5	43 34.53	−	0.16	23.24	0 43 11.13		4.09
	*+1° 50′	24	47.8	49.3	51.6	3.8	5.4	7.1	8.6	10.1	21.8	24.7	26.2	52 6.94		0.16	23.24	0 51 43.54		4.11
	Weisse 1043	25	. .	. .	. .	38.0	39.6	41.3	42.9	44.6	6 6	9.0	0.7	0 47.84		6.68	23.24	1 0 17.92		4.10
	Weisse 42	26	15.5	16.9	19.4	31.6	33.1	34.7	36.6	38.0	50.1	2.9	54.5	5 34.85		0.14	23.24	1 5 11.47		4.11
	Weisse 144	27	20.1	21.8	24.1	36.7	38.2	39.9	41.4	43.0	5 4	8.0	59.6	11 39.84		0.14	23.24	1 11 16.46		4.12
	Polaris	28	. .	. .	. .	. .	48.0	58.0	10.0	.	. .	. .	. .	14 58.67		2.09	23.24	. . . .		51.12
	θ Ceti	29	0.8	2.2	4.7	17.0	18.5	20.1	21.8	23.4	35.3	37.8	39.4	18 20.09		0.18	23.24	1 17 56.67		4.14
11	γ Pegasi	30	1.7	3.1	5.7	17.9	19.5	21.3	23.0	24.5	36.9	39.6	41.2	7 21.31		0.17	22.97	0 6 58.17		3.97
	Lalande 380	31	44.6	46.3	49.5	4.9	6.7	8.8	11.0	12.9	28.2	31.0	32.9	15 8.80		0.24	22.96	0 14 45.60		4.04
	B. A. C. 92	32	50.0	52.5	56.9	18.4	21.2	24.0	27.0	29.6	51.0	55.4	58.4	20 24.04		0.36	22.96	0 20 0.72		4.40
	π Andromedæ	33	1.2	2.5	5.5	7.2	10.4	. .	22.0	25.0	26.9	29.0	31.3	30 46.10		0.31	22.96	0 30 22.83		4.10
	Weisse (2) 749	34	23.7	25.5	28.3	42.8	44.4	46.5	48.4	50.2	4.4	7.4	9.5	30 46.46		0.22	22.96	0 30 23.28		4.10
	***+40° 24′**	35	32.6	34.4	37.7	. .	. .	. .	.	17.3	20.7	22.8	. .	42 57.58		0.26	22.96	0 42 31.36		4.24
	ν **Andromedæ**	36	4.4	6.4	9.6	. .	. .	. .	.	. .	49.2	52.8	54.9	43 29.55		0.26	22.96	0 43 6.33		4.25
	Weisse 801	37	13.9	15.5	17.9	30.0	31.6	33.2	34.9	36.4	48.5	51.0	52.6	47 33.23		0.16	22.96	0 47 10.11		4.09
	***+1° 50′**	38	47.4	48.9	51.4	3.4	5.0	6.6	8.3	9.8	21.7	24.2	25.8	52 6.59		0.15	22.96	0 51 43.48		4.10
	***+1° 57′**	39	. .	. .	. .	. .	. .	. .	1.7	4.2	5.6	7.5	9.3	53 5.66		34.37	22.96	0 52 8.33		4.12
	***−24° 46′**	40	4.2	5.6	8.0	. .	. .	. .	.	. .	41.6	44.2	45.8	57 24.90		0.15	22.96	0 57 1.79		4.36
	Weisse 1085	41	38.0	39.5	42.1	54.0	55.6	57.2	59.0	0.4	12.5	15.1	16.8	2 57.29		0.16	22.96	1 2 34.17		4.12
	Weisse 65	42	27.0	28.9	30.5	32.0	34.8	. .	36.1	38.7	40.3	42.1	44.1	7 5.45		0.24	22.96	1 6 42.25		4.12
	Weisse 66	43	48.4	49.9	52.3	4.5	6.0	7.7	9.4	11.0	23.1	25.7	27.3	7 7.75		0.17	22.96	1 6 44.62		4.12
	B. A. C. 385	44	28.4	30.1	33.0	47.7	49.5	51.7	53.6	55.4	10.0	12.9	15.1	10 51.58		0.14	22.96	1 10 28.48		4.42
	Polaris	45	. .	. .	. .	. .	5.0	17.0	. .	. .	. .	. .	. .	15 41.00		44.25	22.96	. . . .		51.55
	44 **Ceti**	46	59.4	0.9	3.3	15.4	16.9	18.6	20.3	21.9	34.0	36.3	38.0	18 18.64		0.14	22.96	1 17 55.54		4.17
	Weisse 382	47	57.1	58.6	0.9	13.0	14.6	16.4	18.0	19.7	31.8	34.1	36.0	24 16.38		0.16	22.96	1 23 53.26		4.15
	B. A. C. 469	48	17.3	18.8	21.3	33.9	35.4	37.0	38.9	40.5	53.0	55.7	57.4	28 37.20		0.18	22.96	1 28 14.06		4.19
	Weisse 562	49	30.3	31.7	34.3	46.3	47.8	49.4	51.1	52.6	4.6	7.2	8.7	33 49.45		0.15	22.96	1 33 26.34		4.14
	o **Piscium**	50	2.1	3.6	6.1	18.1	19.6	21.4	23.9	24.6	36.6	39.2	40.8	39 21.36	−	0.16	−22.96	1 38 58.24	−	4.16

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Oct. 11, 2.6	− 22.96	+ 0.002	− 0.06	− 0.15

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1877.														m. s.	s.	s.	h. m. s.	s.
Oct. 11 Y.	Lalande 3390	1	48.4	50.7	52.9	54.7	58 0	. .	13.2	16.4	18.3	20.4	22.8	45 35.58	− 0.33	−22.96	1 45 12.29	− 4.49
	*+36° 44′	2	16.1	17.9	20.2	36.1	38.1	40.2	42.3	44.0	58.8	2.0	4.1	45 39.98	0.24	22.96	1 45 16.78	4.49
	B. A. C. 609	3	58.7	0.2	2.7	14.9	16.5	18.2	19.9	21.3	33.5	35.9	37.8	53 18.15	0.16	22.96	1 52 55.03	4.17
	54 Cassiopeæ	4	5.5	9.9	17.6	54.6	58.9	3.8	9.0	13 9	50.1	58.2	2.9	59 4.04	0.62	22.96	1 58 40.46	7.11
	*+38° 59′	5	34.0	35.9	39.2	. .	. .	. .	. .	. .	18.0	21.0	23.2	2 58.55	0.25	22.96	2 2 35.34	4.61
	*+55° 18′	6	. .	. .	. .	3.7	6 4	9.2	12.3	14.6	. .	. .	. .	9 9.24	0.35	22.96	2 8 45.93	5.33
	*+55° 18′	7	. .	. .	. .	36.2	38 7	41.8	44.6	17.4	. .	. .	. .	9 41.74	0.34	22.96	2 9 18.44	5.34
	*+55° 18′	8	. .	. .	. .	8.3	11 7	16.5	21.4	24.5	. .	. .	. .	10 16.48	0.34	22.96	2 9 53.18	5.34
	*+55° 21′	9	. .	. .	. .	33.6	36 3	38.9	42.1	44.7	. .	. .	. .	12 39.12	0.34	22.96	2 12 15.82	5.36
	*+55° 16′	10	14.1	16.9	21.3	. .	. .	. .	. .	. .	14.3	18.7	21.5	12 47.80	0.37	22.96	2 12 24.47	5.36
	Weisse 278	11	46.6	48.1	50.4	2.4	4 1	5.8	7.6	9.0	21.1	23.7	25.2	19 5.82	0.16	22.96	2 18 42.70	4 15
	*+61° 13′	12	53.5	56.5	1.8	26.8	30 1	33.5	37.0	40.3	4.9	10.0	13.5	23 33.45	0.42	22.96	2 23 10.07	5.92
	*+61° 9′	13	10.4	13.6	18.7	44.5	47 2	50.9	54.2	57.7	21.4	26.6	30.0	23 50.47	0.42	22.96	2 23 28.09	5.92
	31 Arietis	14	3.3	4.7	7.5	19.6	21 1	22.9	24.4	26.2	38.4	41.0	42.5	30 22.87	0.17	22.96	2 29 59.74	4.18
	B. A. C. 810	15	34.1	35.5	38.2	50.1	51 6	53.3	55.0	56.7	8.7	11.2	12.9	32 53.39	0.16	22.96	2 32 30.27	4.16
	γ Ceti	16	3.5	5.1	7.7	19.6	21 2	22 9	24.6	26.1	38.0	40.4	42.1	37 22.84	0.15	22.96	2 36 59.73	4.09
	Weisse (2) 1018	17	10.7	12.5	15.0	28.2	30 0	31.8	33.6	35.3	48.3	51.2	53.0	43 31.78	0.19	22.96	2 43 8.63	4.37
	Weisse (2) 790	18	18.0	19.4	21.8	34.0	35 5	37.2	38.9	40.4	52.4	55.1	56.7	47 37.22	0.16	22.96	2 47 14.10	4.13
	Weisse 846	19	. .	. .	. .	1.7	3 2	5.0	6.8	8.2	. .	. .	. .	50 4.98	0.14	22.96	2 49 41.88	4.05
	Weisse 853	20	. .	. .	. .	19.0	20 6	22.1	23.8	25.6	37.3	40.0	41.5	50 28.74	6.62	22.96	2 49 59.16	4.05
	*+38° 26′	21	6.9	8.7	11.8	27.1	29 0	31.1	33.3	35.3	50.3	53.6	55.8	54 31.17	0.24	22.96	2 54 7.97	4.73
	*+37° 6′	22	18.2	20.1	23 3	38.1	40 1	42.1	44.3	46.2	1.0	4.3	6.2	58 42.17	0.24	22.96	2 58 18.97	4.69
	*+37° 13′	23	14.6	16 3	9 5	34.4	36 3	38.3	40.4	42.3	57.6	0.7	2.5	6 38.45	0.24	22.96	3 6 15.25	4.70
	Weisse (2) 209	24	14.4	15 9	8 5	31.6	33.3	35.1	36.9	38.5	51.6	54.3	56.0	11 35.10	0.22	22.96	3 11 11.92	4.34
	*+25° 4′	25	34.1	35 6	38 4	51.4	52.9	54.9	56.8	58.5	11.4	14.2	15.8	16 54.91	0.19	22.96	3 16 31.76	4.37
	*+5° 28′	26	5.1	6 6	9 0	. .	. .	. .	. .	. .	39.5	41.8	43.6	23 24.27	0.17	22.96	3 23 1.14	4.03
	*+5° 31′	27	13.5	15 0	7 6	. .	. .	. .	. .	. .	48.0	50.6	52.6	23 32.88	0.17	22.96	3 23 9.75	4.03
	*+31° 36′	28	26.7	28 5	3 3	45.5	47.2	49.1	51.2	52.8	6.9	9.8	11.8	27 49.16	0.21	22.96	3 27 25.99	4.54
	12 Tauri	29	34.8	36 4	38 7	50.5	52.2	53.8	55.6	57.1	8.9	11.5	13.2	33 53.88	0.15	22.96	3 33 30.77	3.97
	η Tauri	30	17.2	18 8	2 5	34.6	36.2	37.9	39.6	41.4	54.5	57.3	59.0	40 38.00	0.19	22.96	3 40 14.85	4.33
	*−27° 28′	31	31.2	33 0	35 6	49.1	50 8	52.7	54.5	56.2	9.7	12.6	14.4	44 52.71	− 0.14	22.96	3 44 29.61	3.65
	Lalande 7220	32	51.5	52 8	5 5	8.3	10 1	11.7	13.6	15.1	. .	. .	. .	49 4.82	+ 6.84	22.96	3 48 48.70	4.29
	Lalande 7238	33	. .	.	.	34 9	36 5	38.2	40.0	41.7	. .	. .	. .	49 38.26	− 0.18	22.96	3 49 15.12	4.29
	33 Tauri	34	53.0	54 9	7 5	10 4	12 2	13.8	15.7	17.2	30.3	32.9	34.6	50 13.86	0.19	22.96	3 49 50.71	4.29
	*+35° 0′	35	48.1	49 9	2 8	7 4	9 2	11.3	13.3	15.2	29.7	30.8	34.8	55 11.32	0.23	22.96	3 54 48.13	4.63
	Weisse (2) 1251	36	57.1	59 0	2 3	18 5	20 5	22.7	25.0	26.7	42.8	45.9	48.1	0 22.60	0.25	22.96	3 59 59.39	4.88
	Weisse (2) 1269	37	. .	.	.	56 0	58 1	0.3	2.4	4.5	20.4	23.5	25.7	1 8.86	8.85	22.96	4 0 37.05	4.88
	*−31° 38′	38	29.6	31 4	34 1	48 3	50 3	52.2	53.9	55.5	9.7	12.7	14.6	8 52.02	0.14	22.96	4 8 28.92	3.46
	Weisse (2) 203	39	21.0	23.1	24.9	26 4	29 2	. .	32.4	35.0	36.6	38.2	40.3	12 0.71	0.25	22.96	4 11 37.50	4.13
	Weisse (2) 204	40	. .	. .	. .	57 7	59 1	0.9	2.4	4.1	16.7	19.2	21.0	12 7.64	6.96	22.96	4 11 37.72	4.13
	*−25° 42′	41	18.3	20 .	2 8	36 2	37 8	39.6	41.3	43.0	56.3	59.1	0.9	18 39.58	0.14	22.96	4 18 16.48	3.45
	*+16° 28′	42	. .	.	.	.	. .	. .	35.1	37.8	39.4	41.1	43.1	20 39.30	35.83	22.96	4 19 40.51	4.08
	B. A. C. 1404	43	37.8	39 6	42 3	56 6	58 3	0.1	2.0	3.7	17.5	20.5	22.3	26 0.06	0.14	22.96	4 25 36.96	3.35
	Weisse (2) 634	44	48.0	49 7	52 5	6 2	8 0	10.0	11.7	13.4	27.2	30.1	32.1	31 9.90	0.21	22.96	4 30 46.73	4.39
	*−25° 53′	45	24.9	26 3	28 7	.	. .	35.6	37.6	39 4	52.4	55.0	57.1	35 39.67	5.55	22.96	4 35 11.16	3.34
	*+10° 42′	46	30.3	32 4	4 0	35 6	38 4	. .	39.3	41.9	43 5	45.3	47.2	42 8.79	0.24	22.96	4 41 45.59	3.89
	*+10° 40′	47	51.6	53.1	55.6	.	. .	. .	. .	. .	26 5	29.0	30.7	42 11.08	0.18	22 96	4 41 47.94	3.89
	*+10° 41′	48	. .	. .	. .	10 4	11 9	13.6	15.2	17.0	. .	. .	. .	42 13.62	0.16	22.96	4 41 50.50	3.89
	*+10° 45′	49	. .	. .	. .	2 5	4 2	5.8	7.4	9.0	21 0	23.7	25.4	43 12.38	6.76	22.96	4 42 42.66	3.89
	*+43° 15′	50	15.4	17.6	20.9	37 4	9 5	41.9	44.3	46.3	2 5	6.0	8.4	47 41.84	− 0.27	−22.96	4 47 18.61	− 4.9

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Oct. 11, 2.6	− 22.96	+ 0.002	− 0.06	− 0.15

server.	OBJECT.	Number.	I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
			SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.			
77.														m. s.	s.	s.	h. m. s.	s.
t. 11	*+37° 43′ . . .	1	..	..	..	18.4	20.2	22.2	24.3	26.3	..	..	..	51 22.28	− 0.23	−22.96	4 50 59.09	− 4.65
Y.	4 Aurigæ. . . .	2	58.3	59.9	3.2	..	..	..	..	..	41.5	41.7	46.8	51 22.34	0.25	22.96	4 50 59.13	4.65
	11 Orionis. . . .	3	39.8	41.3	43.8	56.3	57.9	59.7	1.4	3.0	15.2	17.8	19.5	57 59.61	− 0.17	22.96	4 57 36.48	3.94
12	κ Aquilæ. . . .	4	23.5	25.2	27.6	39.8	41.3	42.9	44.5	46.2	58.3	0.6	2.2	30 42.92	+ 0.13	23.54	19 30 19.51	3.08
	γ Aquilæ. . . .	5	31.4	32.9	35.6	47.5	49.1	50.9	52.5	54.0	6.2	8.7	10.3	40 50.83	0.11	23.53	19 40 27.41	2.72
	Lalande 37785. .	6	10.3	12.3	15.4	29.8	31.6	33.8	35.9	37.8	52.2	55.2	57.0	44 33.75	0.10	23.53	19 44 10.32	2.05
	*−38° 3′ . . .	7	29.2	31.2	34.3	49.6	52.0	54.1	55.8	57.7	12.6	15.6	17.9	49 53.64	0.20	23.53	19 49 30.31	4.14
	*+31° 59 . . .	8	13.8	15.7	19.0	..	..	..	..	..	55.9	58.7	0.5	55 37.27	0.11	23.53	19 55 13.85	2.13
	*+34° 59′ . . .	9	20.5	22.8	26.0	..	..	..	..	..	2.6	5.5	7.4	55 44.13	+ 0.11	23.53	19 55 20.71	2.13
	*+35° 2′ . . .	10	..	..	..	25.8	28.8	30.6	43.9	46.9	49.1	51.1	53.4	56 41.20	− 33.80	23.53	19 55 43.87	2.13
	*+30° 54′ . . .	11	23.0	25.0	27.9	41.9	43.6	45.5	47.4	49.3	3.2	6.0	7.7	59 45.50	+ 0.10	23.53	19 59 22.07	2.28
	*−9° 15′ . . .	12	..	..	..	..	..	..	..	31.9	34.1	35.7	..	3 33.90	− 17.36	23.52	20 2 53.02	3.31
	*−14° 3′ . . .	13	..	..	..	39.9	41.4	42.8	44.5	46.0	..	..	..	5 42.92	+ 0.13	23.52	20 5 19.53	3.45
	34 Cygni	14	..	..	..	36.3	38.0	40.4	42.6	44.5	59.7	2.7	4.6	13 48.60	− 8.07	23.52	20 13 17.01	2.16
	71 Draconis . . .	15	16.8	20.4	25.8	51.0	54.0	57.1	1.0	4.5	29.9	35.2	38.1	17 57.62	+ 0.14	23.51	20 17 34.25	0.99
	Lalande 39496. .	16	31.9	34.2	36.7	38.5	41.8	..	59.3	2.7	4.6	6.7	9.0	24 20.54	0.20	23.51	20 23 57.23	2.21
	*+38° 57′ . . .	17	57.5	59.6	3.0	18.4	20.3	22.2	24.4	26.6	41.7	44.9	46.7	24 22.30	0.11	23.51	20 23 58.90	2.21
	*+37° 27′ . . .	18	45.7	47.9	51.1	6.9	7.8	9.9	12.0	14.1	29.0	32.3	34.1	30 9.99	+ 0.11	23.51	20 29 46.59	2.30
	*+37° 58′ . . .	19	..	..	..	23.7	26.9	28.6	42.6	46.0	47.9	50.0	52.0	33 39.71	− 35.10	23.50	20 32 41.11	2.31
	O. Arg. S. 20802 .	20	55.4	57.0	59.6	12.6	14.4	16.3	18.0	19.8	32.9	35.5	37.2	38 16.25	+ 0.16	23.50	20 37 52.91	3.90
	O. Arg. S. 20896 .	21	8.4	10.0	13.1	26.5	28.3	29.9	32.0	33.6	47.2	49.8	51.6	44 30.04	0.17	23.50	20 44 6.71	4.04
	57 Cygni	22	..	..	..	15.2	17.3	19.4	21.8	23.9	..	..	..	49 19.52	0.10	23.49	20 48 56.13	2.51
	B A. C. 7259 . .	23	31.6	33.6	37.1	53.5	55.6	57.9	0.2	2.4	18.9	22.3	24.5	49 57.96	0.11	23.49	20 49 34.58	2.52
	*−14° 0′ . . .	24	34.8	36.5	39.0	51.3	52.8	54.6	56.4	57.9	10.4	12.8	14.3	53 54.62	0.14	23.49	20 53 31.27	3.69
	B. A. C. 7320 . .	25	19.8	22.0	25.2	40.3	42.3	44.3	46.3	48.3	3.7	6.7	8.7	58 44.33	0.11	23.49	20 58 20.95	2.51
	Lacaille 8706 . .	26	53.8	55.7	58.6	12.8	14.7	16.7	18.8	20.6	35.0	37.8	39.5	3 16.73	0.18	23.48	21 2 53.43	4.34
	ζ Cygni	27	46.2	47.9	50.7	4.5	6.3	8.2	10.1	12.1	25.7	28.5	30.2	8 8.22	0.10	23.48	21 7 44.84	2.79
	Weisse 239 . .	28	44.0	45.7	48.4	0.5	2.0	3.7	5.4	7.0	19.5	21.9	23.5	13 3.78	0.14	23.48	21 12 40.41	3.77
	Lalande 41624. .	29	..	..	..	14.0	16.0	18.1	20.2	22.1	..	..	..	18 18.08	0.10	23.43	21 17 54.70	2.67
	*+38° 3′ . . .	30	56.5	58.6	1.1	16.9	18.8	20.9	23.0	25.1	40.2	43.5	45.0	19 20.85	0.11	23.48	21 18 57.48	2.68
	*+38° 6′ . . .	31		..	59.3	1.3	3.4	5.5	7.6	..	..	..	..	20 3.42	+ 0.10	23.48	21 19 40.04	2.68
	*−23° 46′ . . .	32		..	..	14.9	16.6	18.5	20.2	22.2	35.4	37.8	39.4	23 25.62	− 6.92	23.47	21 22 55.23	4.09
	*−25° 45′ . . .	33	44.1	45.8	48.5	..	..	..	..	..	22.1	25.0	26.5	27 6.53	+ 0.17	23.47	21 26 43.23	4 17
	δ Aquarii. . . .	34	26.4	28.2	30.8	42.5	44.0	45.7	47.3	48.9	0.7	3.3	4.7	33 45.68	0.12	23.47	21 33 22.33	3.51
	*−24° 13′ . . .	35	2.5	4.5	7.2	20.4	21.8	23.7	25.5	27.2	40.0	43.0	44.7	42 23.68	0.16	23.46	21 42 0.38	4.18
	*−5° 57′ . . .	36	17.6	19.3	21.6	33.7	35.2	36.9	38.4	39.9	52.0	54.6	56.1	46 39.85	+ 0.13	23.46	21 46 16.52	3.73
	*−21° 35′ . . .	37	..	..	..	..	..	26.4	28.0	29.6	42.4	45.0	47.6	53 36.50	− 10.00	23.46	21 53 3.04	4.14
	30 Aquarii. . . .	38	56.1	57.7	0.3	12.1	13.7	15.4	17.0	18.6	30.7	33.2	34.7	57 15.41	+ 0.13	23.45	21 56 52.09	3.80
	ξ Cephei (1st *). .	39	..	..	..	..	..	..	..	..	13.2	19.0	22.5	1 18.23	− 39.27	23.45	22 0 15.51	2.42
	ξ Cephei (2d *). .	40	..	..	..	32.3	35.9	39.8	43.8	46.9	..	..	..	0 39.74	+ 0.13	23.45	22 0 16.42	2.42
	*+16° 34′ . . .	41	..	..	..	24.3	26.9	28.4	39.9	42.6	44.3	45.8	47.8	7 37.50	− 28.85	23.45	22 6 45.20	3.41
	Piazzi 33 . . .	42	30.5	32.3	35.0	47.3	49.0	50.7	52.4	54.1	6.5	9.0	10.5	8 50.66	+ 0.11	23.45	22 8 27.32	3.42
	θ Aquarii . . .	43	28.1	29.8	32.4	44.4	46.0	47.8	49.3	50.9	3.0	5.5	7.0	10 47.65	0.13	23.44	22 10 24.34	3.88
	49 Aquarii . . .	44	45.8	47.6	50.2	3.4	5.1	7.0	8.9	10.7	23.9	26.4	28.1	17 7.01	0.16	23.44	22 16 43.73	4.32
	O. Arg. S. 22165 .	45	24.6	26.2	28.8	42.6	44.2	45.8	47.7	49.8	3.2	6.0	7.7	21 46.05	0.16	23.44	22 21 22.77	4.41
	α Lacertæ . . .	46	10.4	13.0	17.0	35.1	37.3	40.1	42.5	45.0	3.5	7.3	9.5	26 40.06	0.12	23.44	22 26 16.74	3.08
	9 Lacertæ . . .	47	15.4	18.0	22.3	40.9	43.5	45.8	48.4	50.9	10.2	13.9	16.2	32 45.96	0.12	23.43	22 32 22.65	3.13
	*−33° 30 . . .	48	12.5	14.6	17.5	31.9	33.8	35.7	37.7	39.5	53.7	56.7	58.6	43 35.65	0.18	23.43	22 43 12.40	4.72
	Weisse 976 . .	49	10.4	12.1	14.5	26.7	28.5	30.1	31.7	33.3	45.4	48.0	49.5	48 30.02	+ 0.13	23.42	22 48 6.73	4.05
	*−26° 50′ . . .	50	..	..	..	53.7	55.3	57.2	59.0	0.8	14.0	16.9	18.7	51 4.45	− 7.10	−23.42	22 50 33.93	− 4.44

Oct. 12. Image west $0^{s}.30$; clamp east.
Image west $0^{s}.00$; clamp west.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Oct. 12, 21.2	− 23.48	+ 0.036	− 0.06	+ 0.12

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.											Mean wire.	CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.		Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1877. Oct. 12 Y.	Weisse 1149	1	4.2	5.7	7.9	. .	. .	. .	. .	. .	39.3	41.6	43.1	56 23.63	+ 0.16	−23.42	22 56 0.36	− 4.09
	Weisse 1156	2	12.9	14.6	7.3	. .	. .	. .	. .	. .	48.4	50.7	52.2	56 32.68	0.15	23.42	22 56 9.41	4.09
	Lalande 45323	3	12.1	14.2	7.5	32.6	34.4	. .	38.8	40.7	55.9	58.9	1.0	3 36.61	0.11	23.41	23 3 13.31	3.52
	*−5° 24′	4	43.0	45.0	47.5	21.1	22.8	24.7	26.5	28.2	. .	. .	. .	9 24.65	+ 0.13	23.41	23 9 1.37	4.01
	*−5° 20′	5	. .	. .	. .	7.9	9.5	11.1	12.8	14.4	26.3	29.0	30.4	15 17.68	− 6.38	23.41	23 14 47.89	4.02
	B. A. C. 8134	6	. .	. .	. .	43.7	46.4	47.7	58.5	1.2	2.6	4.2	6.2	15 56.31	− 27.75	23.41	23 15 5.15	4.02
	*+66° 16′	7	. .	. .	. .	46.1	50.1	53.9	57.8	1.7	. .	. .	. .	20 53.92	+ 0.14	23.40	23 19 30.66	3.82
	*+15° 12′	8	20.7	22.5	24.8	. .	. .	. .	. .	. .	56.2	58.8	0.5	25 40.58	+ 0.15	23.40	23 25 17.33	3.81
	*+17° 43′	9	. .	. .	. .	. .	. .	. .	47.0	50.0	51.7	53.6	55.4	30 51.54	− 35.60	23.40	23 29 52.54	3.81
	ι Piscium	10	45.5	47.1	49.6	1.6	3.1	4.8	6.4	8.0	20.0	22.5	24.0	34 4.78	+ 0.12	23.40	23 33 41.50	3.95
	*+20° 56′	11	. .	. .	. .	32.8	34.4	36.0	38.0	39.4	. .	. .	. .	46 36.12	0.09	23.39	23 46 12.82	3.87
	*+20° 59′	12	. .	. .	. .	48.9	50.5	52.3	54.1	55.8	. .	. .	. .	46 52.32	+ 0.09	23.39	23 46 29.02	3.87
22	*+34° 58′	13	16.0	17.6	21.0	35.3	37.3	38.9	41.2	43.0	. .	. .	. .	55 31.29	− 7.89	18.78	19 55 4.62	1.90
	*+34° 59′	14	. .	. .	. .	58.6	0.3	2.4	4.4	6.3	21.1	24.1	26.0	56 10.40	− 7.90	18.78	19 55 43.72	1.91
	τ Aquilæ	15	10.0	11.5	14.1	26.1	27.6	29.1	31.0	32.6	44.6	47.1	48.7	58 29.31	+ 0.07	18.78	19 58 10.60	2.73
	υ² Cygni	16	. .	. .	. .	1.2	3.5	5.7	8.2	10.7	. .	. .	. .	10 5.86	− 0.02	18.79	20 9 47.05	1.54
	*+46° 20′	17	39.1	41.6	45.3	. .	. .	. .	. .	. .	28.8	32.6	34.7	10 7.07	0.00	18.79	20 9 48.28	1.54
	B. A. C. 7014	18	7.4	9.0	11.5	23.5	24.9	26.7	28.4	29.7	41.9	44.4	45.8	17 26.65	+ 0.07	18.79	20 17 7.93	2.83
	O. Arg. S. 20533	19	52.8	54.6	57.0	10.0	11.6	13.4	15.1	16.7	29.6	32.4	33.9	22 13.37	0.13	18.79	20 21 54.71	3.57
	O. Arg. S. 20607	20	54.3	56.0	58.8	11.8	13.6	15.4	17.2	18.7	32.0	34.5	36.1	27 15.31	0.14	18.79	20 26 56.66	3.66
	*−19° 12′	21	11.2	13.0	15.6	28.4	29.9	31.8	33.5	35.2	47.8	50.6	52.1	31 31.74	+ 0.13	18.80	20 31 13.07	3.56
	B. A. C. 7148	22	. .	. .	. .	25.7	27.6	29.5	31.2	33.1	46.6	49.4	51.1	34 36.78	− 7.22	18.80	20 34 10.76	3.85
	O. Arg. S. 20812	23	. .	. .	. .	56.5	57.9	59.7	1.3	2.8	. .	. .	. .	38 59.64	+ 0.12	18.80	20 38 40.96	3.66
	O. Arg. S. 20896	24	3.9	5.6	8.7	. .	. .	. .	. .	. .	42.7	45.2	46.7	44 25.47	0.16	18.80	20 44 6.83	3.88
	B. A. C. 7259	25	26.2	28.6	32.4	49.0	50.9	53.1	55.5	57.9	14.5	17.6	19.7	49 53.22	+ 0.00	18.80	20 49 34.42	2.01
	O. Arg. S. 21083	26	42.7	44.2	46.6	18.8	21.4	23.1	34.2	36.8	38.5	41.1	42.3	58 19.06	− 15.98	18.81	20 57 54.27	3.62
	Lalande 41086	27	16.6	18.7	21.8	37.0	38.9	41.0	43.2	45.2	0.8	3.6	5.4	4 41.11	+ 0.01	18.81	21 4 22.31	2.35
	Lacaille 8760	28	0.8	2.9	6.0	21.8	23.7	25.8	27.9	29.9	45.4	48.5	50.7	10 25.76	+ 0.20	18.81	21 10 7.15	4.43
	*+48° 50′	29	56.1	58.5	2.2	. .	. .	. .	. .	. .	48.5	52.0	53.8	16 25.18	0.00	18.81	21 16 6.37	2.10
	*+48° 48′	30	. .	. .	. .	. .	. .	. .	. .	. .	11.6	15.2	17.8	17 14.87	− 26.23	18.81	21 16 29.83	2.11
	O. Arg. N. 22321	31	8.6	13.2	20.8	55.1	59.7	4.1	9.2	13.8	48.9	55.3	59.9	24 4.42	− 0.10	18.82	21 23 45.50	0.81
	*+38° 0′	32	32.8	34.8	37.8	53.1	55.0	57.0	59.1	1.0	16.2	19.1	21.2	28 57.01	+ 0.01	18.82	21 28 38.20	2.57
	d Aquarii	33	21.8	23.4	25.9	37.7	39.3	40.9	42.6	44.2	56.1	58.7	0.1	33 40.97	0.08	18.82	21 33 22.23	3.39
	*+36° 59′	34	58.9	0.9	4.0	19.1	20.8	22.7	24.8	26.9	41.9	44.9	46.8	37 22.88	0.01	18.82	21 37 4.07	2.63
	B. A. C. 7590	35	15.7	17.5	20.0	32.5	34.1	35.9	37.5	39.1	51.6	54.2	55.7	41 35.80	0.05	18.83	21 41 17.02	3.14
	O. Arg. S. 21710	36	14.6	16.3	18.8	31.6	33.2	35.0	36.9	38.4	51.2	53.8	55.3	46 35.01	0.13	18.83	21 46 16.31	3.93
	*−20° 37′	37	3 .8	33.6	35.8	48.7	50.2	51.9	53.4	55.3	8.5	11.0	12.7	52 52.08	0.13	18.83	21 52 33.38	3.99
	Weisse (2) 1398	38	5 .0	59.0	2.6	17.2	19.2	21.3	23.4	25.3	40.2	43.2	45.1	57 21.23	0.01	18.83	21 57 2.41	2.86
	α Aquarii	39	3 .0	32.7	35.3	47.1	48.5	50.1	51.9	53.4	5.4	7.7	9.3	59 50.22	+ 0.08	18.83	21 59 31.47	3.57
	*−12° 12′	40	. .	. .	. .	57.7	59.3	1.0	2.5	4.1	16.5	19.0	20.4	6 7.56	− 6.52	18.84	22 5 42.20	3.84
	*+37° 42′	41	0.5	2.9	5.6	. .	. .	. .	. .	. .	44.2	47.2	48.7	11 24.85	+ 0.02	18.84	22 11 6.01	2.96
	*+36° 36′	42	40.3	42.5	45.3	0.2	2.0	3.9	5.9	8.1	23.4	26.4	28.3	17 4.21	0.01	18.84	22 16 45.38	3.03
	*+ 6° 43′	43	27.5	29.0	31.3	43.3	44.8	46.5	48.2	49.9	1.9	4.5	6.5	26 46.67	0.07	18.85	22 26 27.89	3.57
	*+ 6° 43′	44	8.3	10.5	12.5	14.1	16.2	. .	16.7	19.2	20.8	22.4	24.6	26 46.53	0.14	18.85	22 26 27.82	4.17
	O. Arg. S. 22282	45	54.8	56.8	59.4	12.1	13.9	15.7	17.6	19.2	21.9	24.6	26.1	31 15.65	0.14	18.85	22 30 56.94	4.17
	ζ Pegasi	46	2 .5	24.2	26.8	38.8	40.2	42.0	43.7	45.3	57.6	0.0	1.4	35 42.05	+ 0.06	18.85	22 35 23.26	3.56
	B. A. C. 7941	47	. .	. .	. .	8.4	17.5	28.4	38.1	46.9	. .	. .	. .	39 27.86	− 0.28	18.85	22 39 8.73	2.01
	Lalande 44918	48	5 .5	55.7	58.8	13.8	15.8	18.0	20.2	22.0	37.3	40.5	42.4	52 18.00	+ 0.01	18.86	22 51 59.15	3.32
	Lalande 44922	49	33.8	36.0	38.1	40.2	43.4	. .	0.4	2.9	6.1	8.1	10.3	52 21.93	0.10	18.86	22 52 3.17	3.32
	Weisse 1204	50	6.0	7.6	10.4	22.5	24.0	25.7	27.3	28.9	41.2	43.8	45.3	58 25.70	+ 0.11	−18.86	22 58 6.95	− 4.04

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Oct. 22, 23.0	− 18.86	− 0.026	− 0.12	+ 0.08

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right. Ascension.	Reduction to 1877.0.
877.														m. s.	s.	s.	h. m. s.	s.
:t. 22 Y.	56 Pegasi	1	. .	. .	. .	46.6	49.0	50.8	2.8	5.6	7.4	9.1	11.2	2 0.31	– 30.55	–18.86	23 1 10.90	– 3.53
	59 Pegasi	2	34.8	36.4	38.9	51.2	52.7	54.2	56.0	57.4	9.7	12.1	13.6	5 54.27	+ 0.06	18.86	23 5 35.47	3.74
	O. Arg. S. 22727	3	31.8	33.5	36.2	48.8	50.5	52.3	54.0	55.6	8.2	10.8	12.4	10 52.19	0.13	18.86	23 10 33.46	4.21
	B. A. C. 8134	4	4.8	6.2	8.8	20.7	22.3	23.9	25.4	27.0	39.0	41.5	43.0	15 23.87	0.09	18.87	23 15 5.09	3.97
	Radcliffe 6081	5	44.9	48.4	50.6	53.3	57.6	. .	40.8	45.2	48.0	50.8	54.1	21 49.37	+ 0.10	18.87	23 21 30.60	3.55
	*+54° 12′	6	16.1	19.1	23.4	43.7	46.7	49.2	52.0	54.9	15.2	19.0	22.0	21 49.21	– 0.03	18.87	23 21 30.31	3.56
	B. A. C. 8280	7	37.8	41.1	46.1	9.0	12.2	15.4	18.9	21.8	45.3	49.6	53.0	43 15.47	– 0.05	18.88	23 42 56.54	3.91
	*+34° 19′	8	59.0	1.1	4.1	18.6	20.4	22.2	24.1	26.0	40.6	43.6	45.2	47 22.26	+ 0.01	18.88	23 47 3.39	3.82
	ω Piscium	9	3.2	4.7	7.4	19.2	20.7	22.3	24.2	25.7	37.7	40.1	41.7	53 22.45	+ 0.07	18.88	23 53 3.64	3.97
	B. A. C. 8364	10	22.2	25.1	29.7	52.2	54.9	57.8	1.0	4.2	26.8	30.9	33.9	58 58.06	– 0.04	18.88	23 58 39.14	4.12
	γ Pegasi	11	57.2	58.8	1.5	13.6	15.3	17.0	18.8	20.4	32.6	35.1	36.8	7 17.01	+ 0.05	18.89	0 6 58.17	3.97
	*+42° 39′	12	37.4	39.7	43.5	. .	. .	. .	. .	. .	24.2	27.3	29.3	24 3.57	0.01	18.90	0 23 44.68	4.15
	*+42° 39′	13	13.9	16.6	18.7	20.9	24.6	. .	46.9	50.0	52.2	54.7	56.9	24 5.54	0.10	18.90	0 23 46.74	4.15
	Lalande 1003	14	57.7	59.6	2.9	17.6	19.4	. .	23.4	25.3	40.3	43.4	45.4	33 21.50	0.01	18.90	0 33 2.61	4.15
	*+36° 30′	15	56.7	58.2	1.3	16.2	17.9	20.2	22.2	24.2	39.2	42.1	44.0	52 20.20	0.01	18.91	0 52 1.30	4.29
	*+3° 47′	16	22.2	23.7	26.5	38.5	40.0	41.5	43.1	44.8	57.0	59.3	0.9	56 41.59	0.07	18.91	0 56 22.75	4.16
	29 Ceti	17	43.0	44.6	47.1	58.9	0.6	2.2	43.9	5.4	17.2	19.8	21.3	2 2.18	+ 0.08	18.91	1 1 43.35	4.18
	*+11° 43′	18	. .	. .	. .	. .	. .	. .	0.8	3.5	5.0	6.7	8.7	6 4.94	– 34.72	18.91	1 5 11.31	4.18
	Weisse 42	19	10.6	12.4	14.9	. .	. .	. .	. .	. .	45.7	48.4	49.7	5 30.28	+ 0.07	18.91	1 5 11.44	4.18
	Weisse 144	20	15.8	17.3	20.1	32.2	33.8	35.6	37.1	38.6	50.8	53.4	54.9	11 35.42	+ 0.06	18.92	1 11 16.56	4.20
	Polaris	21	. .	. .	. .	15.0	54.0	6.0	. .	. .	. .	. .	. .	14 55.00	– 2.05	18.92	. . . .	51.59
	*–37° 31′	22	16.1	18.1	21.2	36.2	38.1	40.4	42.5	44.2	59.5	2.5	4.3	23 40.28	+ 0.19	18.92	1 23 21.55	4.57
	Weisse (2) 575	23	28.4	30.2	32.6	45.0	46.5	48.1	50.1	51.6	3.8	6.4	8.0	27 48.25	+ 0.05	18.92	1 27 29.38	4.25
	*+37° 39′	24	48.7	50.9	54.0	9.0	11.0	12.9	15.1	17.0	32.0	35.1	37.1	34 12.98	– 0.01	18.93	1 33 54.04	4.57
	ο Piscium	25	57.9	59.4	1.9	13.8	15.5	17.2	18.9	20.5	32.4	35.0	36.6	39 17.19	+ 0.06	18.93	1 38 58.32	4.26
23	ω Piscium	26	3.3	4.7	7.4	19.4	20.9	22.5	24.2	25.7	37.8	40.4	41.8	53 22.55	0.06	18.93	23 53 3.68	3.97
	B. A. C. 8364	27	22.1	24.8	29.6	52.1	55.0	58.1	1.1	4.1	26.4	31.1	33.8	58 58.02	0.02	18.93	23 58 39.11	4.10
	*+57° 42′	28	. .	. .	. .	7.6	10.3	13.1	16.6	19.5	. .	. .	. .	0 13.42	0.00	18.93	23 59 54.49	4.12
	γ Pegasi	29	57.2	58.9	1.5	13.8	15.4	17.1	18.8	20.4	32.8	35.4	36.8	7 17.10	0 05	18.93	0 6 58.22	3.97
	Lacaille 48	30	38.3	40.0	42.9	56.0	57.6	59.5	1.3	3.0	16.1	18.8	20.4	14 59.45	0.11	18.93	0 14 40.63	4.39
	B. A. C. 83	31	19.5	22.4	26.3	45.7	48.1	50.7	53.5	56.1	15.6	19.6	22.3	18 50.89	0.02	18.93	0 18 31.98	4.25
	*+38° 16′	32	21.7	24.0	26.2	28.2	31.5	. .	48.2	51.7	53.7	55.8	58.2	25 9.92	0.13	18.94	0 24 51.11	4.11
	*+38° 15′	33	49.4	51.5	54.8	9.9	12.0	14.0	16.1	18.0	33.1	36.4	38.3	25 13.96	0.04	18.94	0 24 55.06	4.11
	Weisse 446	34	40.9	42.5	45.0	57.0	58.6	0.2	1.8	3.3	15.5	17.7	19.3	29 0.16	0.07	18.94	0 28 41.29	4.09
	Weisse (2) 832	35	59.3	1.1	3.9	17.2	19.0	20.8	22.6	24.4	37.8	40.5	42.2	33 20.80	0.04	18.94	0 33 1.90	4.09
	*+47° 11′	36	57.6	59.7	3.3	21.0	23.1	25.6	27.9	30.4	47.9	51.8	53.8	39 25.65	0.04	18.94	0 39 6.75	4.36
	*+47° 12′	37	32.7	35.7	38.5	40.6	44.2	. .	13.1	17.0	19.3	21.7	24.4	39 28.72	0.15	18.94	0 39 9.93	4.36
	*+40° 24	38	. .	. .	. .	49.4	51.3	53.5	55.8	57.8	. .	. .	. .	42 53.56	0.02	18.94	0 42 34.64	4.27
	ν Andromedæ	39	. .	. .	. .	21.4	23.3	25.4	27.6	29.7	. .	. .	. .	43 25.48	0.02	18.94	0 43 6.56	4.28
	Lalande 1627	40	56.4	58.5	1.5	16.4	18.0	20.0	22.2	24.2	39.2	42.3	44.1	52 20.26	0.04	18.94	0 52 1.36	4.29
	θ Cassiopeæ	41	28.1	31.0	35.5	55.7	58.3	1.4	4.1	7.1	27.6	31.8	33.8	4 1.31	+ 0.02	18.95	1 3 42.38	4.84
	Polaris	42	. .	. .	. .	38.0	44.0	53.0	3.0	9.0	. .	. .	. .	14 53.40	– 0.52	18.95	. . . .	51.65
	*–37° 31′	43	16.4	18.4	21.6	36.6	38.4	40.5	42.7	44.7	59.7	2.7	4.6	23 40.57	+ 0.14	18.95	1 23 21.76	4.58
	*+15° 4′	44	31.3	33.0	35.5	47.9	49.6	51.2	52.9	54.5	6.9	9.4	10.9	26 51.19	0.04	18.95	1 26 32.28	4.26
	Weisse (2) 575	45	28.2	29.9	32.4	44.9	46.4	48.1	49.7	51.4	3.9	6.4	7.9	27 48.11	0.04	18.95	1 27 29.20	4.26
	Lacaille 477	46	3.4	5.2	8.2	22.4	24.2	26.2	28.2	30.0	44.1	47.0	48.9	33 26.16	0.13	18.96	1 33 7.33	4.46
	ο Piscium	47	57.8	59.5	2.1	14.1	15.6	17.2	19.0	20.5	32.6	35.1	36.5	39 17.27	0.06	18.96	1 38 58.37	4.27
	Lalande 3390	48	43.8	46.0	48.2	50.2	53.4	. .	8.4	11.8	13.6	15.9	18.1	45 30.94	0.13	18.96	1 45 12.11	4.62
	*+36° 44′	49	11.8	13.9	16.9	32.2	33.8	35.6	37.4	39.5	53.4	57.5	59.4	45 35.58	0.04	18.96	1 45 16.66	4.62
	56 Ceti	50	56.8	58.5	1.3	14.3	16.0	17.9	19.6	21.2	34.0	36.8	38.5	51 17.72	+ 0.11	–18.96	1 50 58.87	– 4.30

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Oct. 23, 2.3	– 18.97	– 0.018	– 0.07	+ 0.07

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reductio to 1877.0.
														m. s.	s.	s.	h. m. s.	s.
1877. Oct. 23	Weisse 973 . .	1	1.5	3.4	5.8	18.0	19.6	21.2	23.0	24.6	36.9	39.4	40.8	56 21 29	+ 0.06	−18.96	1 56 2.39	− 4.31
Y.	*+38° 59′ . . .	2	33.1	35.1	38.4	53.8	55.8	58.0	0.1	2.0	17.5	20.6	22.6	1 57.91	+ 0.03	18.97	2 1 38.97	4.76
	*+38° 59′ . . .	3	. .	. .	. .	50.5	52.3	54.2	56.4	58.6	13.8	17.0	18.6	3 2.68	− 8.31	18.97	2 2 35 40	4.71
	Weisse 102 . .	4	17.6	19.3	21.8	53.8	55.3	57.0	58.6	0.1	12.1	14.8	16.2	8 56.96	+ 0.07	18 97	2 8 38.06	4.27
	B. A. C. 718 . .	5	4.6	7.5	12.0	. .	. .	. .	. .	. .	7.3	11.7	14.5	13 39.60	0.03	18.97	2 13 20.66	5.69
	*+56° 40′ . . .	6	25.2	28.4	33.2	. .	. .	. .	. .	. .	28.0	32.7	35.2	14 0.45	+ 0.03	18.97	2 13 41.51	5.69
	*+56° 41′ . . .	7	. .	. .	. .	. .	. .	. .	. .	. .	4.2	8.6	11.3	15 8.03	− 31.41	18.97	2 14 17.65	5.70
	*+56° 41′ . . .	8	. .	. .	. .	. .	. .	. .	. .	. .	21.9	26.3	29.1	15 25.77	31.41	18.97	2 14 35.39	5.70
	*+56° 41′ . . .	9	. .	. .	. .	. .	. .	. .	. .	. .	31.5	39.0	41.8	15 38.43	− 31.41	18.97	2 14 48.05	5.70
	*+9° 58′ . . .	10	9.9	11.5	14.2	26.2	27.8	29.4	30.9	32.6	44.8	47.5	48.9	19 29.43	+ 0.06	18.97	2 19 10 52	4.32
	Weisse 305 . .	11	13.6	15.3	17.9	. .	. .	. .	. .	. .	48.5	51.0	52.6	20 33 15	0.07	18.97	2 20 14.25	4.32
	Weisse 306 . .	12	. .	. .	. .	32.5	34.0	35.6	37.4	39.0	. .	. .	. .	20 35.70	+ 0.05	18.97	2 20 16.78	4.32
	Lacaille 767 . .	13	. .	. .	. .	21.0	22.8	24.9	26.8	28.7	43.1	46.0	47.6	25 32.61	− 7.65	18.97	2 25 5.99	4.28
	Weisse (2) 727 .	14	29.9	31.9	34.7	47.7	49.5	51.4	53.2	55.0	7.9	11.1	12.8	31 51.37	+ 0.05	18.97	2 31 32.45	4.56
	O. Arg. S. 1744 .	15	31.0	32.8	35.4	48.0	49.6	51.4	53.0	54.6	7.2	9.9	11.3	35 51.29	0.10	18.97	2 35 32.42	4.18
	*+56° 32′ . . .	16	1.1	4.4	8.9	30.2	33.1	36.0	38.9	42.0	3.6	8.2	10.9	40 36.12	0.02	18.97	2 40 17.17	5.90
	B. A. C. 858 .	17	16.7	20.0	24.4	45.9	8.7	51.8	54.7	57.8	19.2	23.6	26.2	40 51.73	0.02	18.97	2 40 32.78	5.91
	*+38° 26′ . . .	18	2.6	4.9	8.1	23.2	25.2	27.3	29.4	31.3	46.6	49.6	51.7	54 27.26	0.03	18.98	2 54 8.31	4.97
	*+37° 6′ . . .	19	14.1	16.2	19.4	34.2	36.2	38.2	40.2	42.2	57.3	59.4	2.2	58 38.15	0.03	18.98	2 58 19.20	4.93
	*+38° 28′ . . .	20	51.8	53.8	56.8	12.2	14.3	16.1	18.2	20.1	35.3	38.2	40.6	6 16.13	0.03	18.98	3 5 57.18	5.01
	ζ Arietis	21	52.8	54.7	57.4	10.2	11.8	13.5	15.2	17.0	29.7	32.4	33.9	8 13.51	0.05	18.98	3 7 54.58	4.51
	Weisse 173 . .	22	39.6	41.3	43.8	56.3	57.7	59.5	1.3	2.8	15.1	17.7	19.3	11 59.49	0.05	18.99	3 11 40.55	4.40
	*+46° 50′ . . .	23	34.3	37.1	40.5	57.8	0.0	2.3	4.7	7.1	24.6	28.0	30.3	26 2.43	0.03	18.99	3 25 43.47	5.46
	*+46° 50′ . . .	24	2.0	4.5	8.3	. .	. .	. .	. .	. .	52.3	55.9	58.2	28 30.20	0.04	18.99	3 28 11.25	5.47
	*+46° 50′ . . .	25	21.9	24.2	28.0	. .	. .	. .	. .	. .	12.2	15.8	18.1	28 50.03	0.04	18.99	3 28 31.08	5.47
	12 Tauri	26	30.6	32.2	35.0	46.7	48.4	50.0	51.8	53.3	5.1	7.7	9.2	33 50.00	0.07	18.99	3 33 31.08	4.20
	*+23° 14′ . . .	27	19.8	21.8	24.5	37.4	39.0	40.8	42.6	44.3	57.2	0.0	1.7	39 40.83	0.06	18.99	3 39 21.90	4.58
	Radcliffe 1084. .	28	47.4	49.5	52.6	8.5	10.6	12.8	14.9	16.9	32.6	35.8	37.7	44 12.66	0.03	19.00	3 43 53.69	5.17
	78 Eridani. . . .	29	30.2	32.1	34.7	47.6	49.5	51.4	53.3	55.0	8.2	10.9	12.5	48 51.40	0.11	19.00	3 48 32.51	3.89
	γ^1 Eridani. . . .	30	20.5	22.2	24.8	36.9	38.5	40.2	41.9	43.6	56.1	58.5	0.1	52 40.30	0.09	19.00	3 52 21.39	3.96
	Weisse (2) 1251 .	31	53.3	55.3	8.7	14.6	16.6	18.8	20.9	23.0	38.6	42.1	44.0	0 18.72	+ 0.03	19.00	3 59 59.75	5.22
	Weisse (2) 1269 .	32	. .	. .	.	52.0	54.0	56.3	58.4	0.5	16.4	19.8	21.7	1 4.89	− 8.58	19.00	4 0 37.31	5.22
	*+16° 59′ . . .	33	40.4	42.0	44.8	57.3	58.8	0.7	2.5	4.1	16.4	18.9	20.5	5 0.58	+ 0.05	19.00	4 4 41.63	4.41
	Rumker 1110 . .	34	31.3	33.0	35.5	48.3	49.8	51.6	53.4	55.0	7.3	10.0	11.6	5 51.53	0.05	19.00	4 5 32.58	4.41
	Lalande 7987 . .	35	29.9	31.4	34.2	46.4	48.0	49.7	51.3	53.0	5.5	8.2	9.7	10 49.75	0.05	19.00	4 10 30.80	4.39
	*−25° 42′ . . .	36	14.5	16.3	19.0	32.3	34.0	35.8	37.7	39.4	52.7	54.4	56.9	18 35.73	+ 0.11	19.01	4 18 16.83	3.73
	*+16° 28′ . . .	37	. .	. .	. .	15.6	18.3	20.0	31.2	34.0	35.5	37.4	39.2	20 28.90	− 28.89	19.01	4 19 41.00	4.38
	B A. C. 1404 . .	38	33.8	35.8	38.7	52.4	54.2	56.1	57.9	59.8	13.9	16.6	18.5	25 56.15	+ 0.12	19.01	4 25 37.26	3.64
	*+3° 49′ . . .	39	34.7	36.3	39.0	50.8	52.4	53.9	55.6	57.2	9.2	11.6	13.2	29 53.99	0.07	19.01	4 29 35.05	4.09
	*−25° 53′ . . .	40	11.3	13.0	15.4	28.5	30.2	31.8	33.5	35.0	48.4	51.7	53.5	35 32.03	0.11	19.01	4 35 13.13	3.63
	*+10° 40′ . . .	41	26.4	28.3	30.1	31.7	34.2	. .	35.4	38.2	39.7	41.5	43.3	42 4.88	0.13	19.01	4 41 46.00	4.20
	*+10° 40′ . . .	42	47.9	49.4	51.8	. .	. .	. .	. .	. .	22.6	24.9	26.6	42 7.20	0.07	19.01	4 41 48.26	4.20
	*+10° 40′ . . .	43	. .	. .	. .	6.7	8.2	9.9	11.6	13.2	. .	. .	. .	42 9.92	0.05	19.01	4 41 50.96	4.20
	*+10° 45′ . . .	44	. .	. .	. .	58.6	0.0	1.7	3.4	5.0	. .	. .	. .	43 1.74	0.05	19.01	4 42 42.78	4.20
	Weisse 925 . .	45	11.0	12.7	15.2	27.3	28.7	30.4	31.9	33.7	45.5	48.1	49.5	44 30.36	0.07	19.01	4 41 11.42	4.00
	*+38° 17′ . . .	46	14.5	17.0	19.0	21.1	24.2	. .	. .	. .	. .	. .	. .	52 19.16	43.60	19.02	4 52 43.74	5.07
	*+38° 17′ . . .	47	. .	. .	. .	6.9	8.7	10.5	12.7	14.9	. .	. .	. .	53 10.74	0.04	19.02	4 52 51.76	5.07
	Rumker 2533 . .	48	15.7	17.6	20.5	34.2	36.0	37.9	39.8	41.8	55.5	58.3	0.0	3 37.94	0.04	19.02	5 3 18.96	4.71
	Weisse 136 . .	49	41.6	43.2	45.7	57.8	59.3	1.0	2.6	4.2	16.3	18.7	20.5	8 0.99	0.08	19.02	5 7 42.05	3.7
	β Orionis. . . .	50	41.0	42.5	45.0	7.0	58.5	0.2	2.0	3.6	5.7	18.1	19.6	9 0.29	+ 0.08	−19.02	5 8 41.35	− 3.7

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Oct. 23, 2.3	− 18.97	− 0.018	− 0.07	+ 0.07

server.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
877.														m. s.	s.	s.	h. m. s.	s.
t. 24	r Aquilæ	1	10.2	11.8	14.5	26.3	27.9	29.6	31.2	32.8	44.7	47.3	48.9	58 29.56	+ 0.06	−19.15	19 58 10.47	− 2.70
Y.	ξ² Capricorni	2	37.2	38.9	41.6	53.7	55.4	57.0	58.6	0.2	12.5	15.0	16.5	5 56.96	0.07	19.15	20 5 37.88	3.23
	*+38° 19′	3	. .	. .	. .	35.2	37.3	39.3	41.4	43.3	. .	. .	. .	7 39.50	+ 0.04	19.14	20 7 20.40	1.82
	*+38° 19′	4	. .	. .	. .	4.8	7.9	9.9	23.9	27.0	29.0	31.2	33.5	8 20.90	− 35.33	19.14	20 7 26.43	1.82
	34 Cygni	5	11.8	13.8	17.0	32.1	34.1	36.0	38.3	40.2	55.2	58.4	0.1	13 36.09	+ 0.05	19.14	20 13 17.00	1.89
	π Capricorni	6	18.9	20.6	23.5	36.0	37.6	39.3	41.1	42.7	55.2	58.0	59.6	20 39.32	0.08	19.14	20 20 20.26	3.45
	B. A. C. 7080	7	42.8	44.5	47.0	59.0	0.6	2.3	3.9	5.7	17.6	20.2	21.6	26 2.29	0.07	19.14	20 25 43.22	3.27
	*+27° 21′	8	20.8	22.6	25.6	38.9	40.7	42.5	44.4	46.1	59.6	2.2	3.9	32 42.48	0.05	19.14	20 32 23.39	2.38
	O. Arg. S. 20819	9	. .	. .	. .	18.5	20.0	22.1	23.8	25.6	. .	. .	. .	39 22.00	0.07	19.14	20 39 2.93	3.71
	*−24° 8′	10	40.4	42.4	44.4	46.3	48.6	. .	. .	. .	. .	. .	. .	38 44.42	37.39	19.14	20 39 2.67	3.71
	*−24° 8′	11	4.7	6.7	9.3	. .	. .	. .	. .	. .	42.5	45.3	46.9	39 25.90	0.09	19.14	20 39 6.85	3.71
	*+38° 50′	12	27.1	29.4	32.6	48.0	49.9	52.0	54.2	56.1	11.4	14.6	16.4	44 51.97	0.05	19.14	20 44 32.88	2.11
	*+37° 56′	13	19.8	21.9	25.0	. .	. .	. .	. .	. .	3.3	6.4	8.4	47 44.13	0.06	19.14	20 47 25.05	2.16
	*−19° 37′	14	42.9	44.9	48.1	59.9	1.4	3.2	5.0	6.5	. .	. .	. .	52 56.49	6.95	19.14	20 52 44.30	3.66
	12 Aquarii	15	37.4	39.1	41.5	53.5	55.0	56.7	58.3	59.9	12.0	14.4	15.9	57 56.70	0.07	19.14	20 57 37.63	3.35
	Weisse (2) 154	16	52.6	54.5	57.7	12.4	14.3	16.2	18.3	20.1	34.9	37.9	39.6	8 16.23	0.05	19.14	21 7 57.14	2.42
	Lalande 41419	17	42.4	44.4	47.6	. .	. .	. .	. .	. .	26.3	29.5	31.4	13 6.93	0.06	19.14	21 12 47.85	2.36
	Weisse 364	18	9.3	10.8	13.4	25.5	27.0	28.9	30.8	32.7	44.0	46.3	47.6	17 28.75	0.07	19.14	21 17 9.68	3.56
	*+36° 9′	19	12.3	14.3	17.3	32.2	34.1	36.2	38.3	40.0	51.7	57.8	59.9	20 36.10	+ 0.05	19.14	21 20 17.01	2.51
	69 Cygni	20	. .	. .	. .	3.2	5.0	7.0	9.2	11.1	25.9	29.0	30.9	21 15.16	− 7.97	19.13	21 20 48.06	2.51
	*+38° 0′	21	. .	. .	. .	. .	. .	. .	. .	. .	24.7	28.2	29.7	29 27.53	− 21.85	19.13	21 28 46.55	2.53
	*+36° 59′	22	59.0	1.0	4.4	19.0	21.0	23.2	25.3	27.2	42.1	45.1	46.7	37 23.09	+ 0.05	19.13	21 37 4.01	2.63
	B. A. C. 7590	23	15.9	17.6	20.2	32.7	34.3	36.0	37.8	39.6	51.7	54.3	55.9	41 36.00	0.05	19.13	21 41 16.92	3.10
	μ Capricorni	24	38.4	40.1	42.6	55.0	56.5	58.2	0.0	1.5	13.9	16.4	18.0	46 58.24	0.07	19 13	21 46 39.18	3.79
	*−20° 37′	25	52.0	53.9	56.5	9.1	10.9	12.6	14.3	16.0	28.8	31.5	33.0	51 12.60	0.05	19.13	21 50 53.52	3.09
	ξ Cephei (1st *)	26	7.4	11.5	15.3	19.1	24.8	. .	42.4	48.4	52.0	55.7	59.8	0 33.64	0.23	19.13	22 0 14.74	1.97
	ξ Cephei (2d *)	27	50.9	54.7	0.1	27.7	31.1	34.8	38.4	42.0	9.5	15.2	16.4	0 34.62	0.06	19.13	22 0 15.55	1.97
	B. A. C. 7744	28	22.9	24.7	27.2	39.0	40.6	42.4	44.0	45.5	57.5	59 9	1.4	6 42.28	0.06	19.13	22 6 23.21	3.67
	Weisse 223	29	43.9	45.5	48.0	0.2	1.7	3.3	4.9	6.6	18.6	21.1	22.7	13 3.32	+ 0.07	19.13	22 12 44.26	3.76
	*+36° 34′	30	. .	. .	. .	0.2	2.2	4.2	6.2	8.3	23.6	26.2	28.1	17 12.38	− 8.02	19.13	22 16 45.23	3.00
	*+6° 43′	31	27.3	28.9	31.2	. .	. .	. .	. .	. .	. .	. .	. .	26 29.13	+ 17.45	19.13	22 26 27.45	3.55
	*+6° 43′	32	. .	. .	. .	. .	45.1	46.7	48.5	. .	2.4	4.7	6.6	26 55.67	− 8.63	19.13	22 26 27.91	3.55
	*+50° 47′	33	. .	. .	. .	28.7	31.3	33.8	36.4	38.6	. .	. .	. .	40 33.76	+ 0.03	19.12	22 40 14.67	3.01
	*+35° 36′	34	41.5	43.3	46.5	1.0	3.0	5.3	7.0	9.0	23.5	26.7	28.6	50 5.04	0.05	19.12	22 49 45.97	3.31
	B. A. C. 8010	35	57.9	59.6	2.2	14.2	15.8	17.5	19.1	20.7	33.0	35.4	36.9	54 17.48	0.07	19.12	22 53 58.43	3.95
	A Piscium	36	26.6	28.3	30.8	41.6	44.2	45.8	47.5	49.0	. .	. .	. .	2 39.22	6.53	19.12	23 2 26.63	3.80
	B. A. C. 8065	37	9.2	10.7	13.2	25.1	26.7	28.3	30.0	31.5	43.5	45.9	47.3	3 28.31	0.06	19.12	23 3 9.25	3.80
	B. A. C. 8091	38	58.6	0.4	3.4	16.9	18.5	20.3	22.0	23.9	37.2	40.1	41.7	9 20.27	0.05	19.12	23 9 1.20	3.54
	*−6° 11′	39	27.7	29.4	32.1	43.9	45.8	48.0	50.2	52.3	. .	. .	. .	11 41.18	6.57	19.12	23 11 28.63	3.95
	B. A. C. 8139	40	21.0	22.9	26.0	41.3	43.2	45.3	47.2	49.4	4.5	7.7	9.6	15 45.28	0.05	19.12	23 15 26.21	3.51
	γ Cephei	41	16.7	23.8	35.0	28.3	34.7	41.7	49.5	56.3	49.4	0.0	6.8	34 42.02	0.09	19.12	. . . .	4.35
	B. A. C. 8280	42	37.6	40.9	45.7	9.3	12.0	15.3	18.7	21.8	45.2	49.8	52.8	43 15.37	0.05	19.12	23 42 56.30	3.88
	B. A. C. 8311	43	32.7	34.3	36.8	48.7	50.3	52.0	53.6	55.3	7.1	9.5	11.2	48 51.95	0.06	19.12	23 48 32.89	4.00
	ω Piscium	44	3.5	5.1	7.7	19.6	21.0	22.8	24.4	25.9	38.0	40.5	42.0	53 22 77	0.06	19.12	23 53 3.71	3.97
	B. A. C. 8374	45	15.0	16.9	19.7	33.4	35.0	36.9	38.8	40.4	53.9	56.9	58.6	0 36.86	0.05	19.11	0 0 17.80	3.89
	γ Pegasi	46	57.3	59.0	1.7	13.9	15.5	17.1	18.9	20.6	32.9	35.3	36.9	7 17.19	+ 0.05	19.11	0 6 58.13	3.96
31	α Lyræ	47	41.0	42.9	46.0	1.3	3.3	5.5	7.6	9.5	24.8	28.0	30.1	32 5.45	− 0.21	17.75	18 32 47.49	1.05
	β Lyræ	48	28.7	30.4	33.5	47.7	49.5	51.4	53.5	55.3	9.5	12.4	14.6	45 51.50	0.18	17.73	18 45 33.59	1.36
	γ Aquilæ	49	25.6	27.1	29.6	41.7	43.3	45.0	46.6	48.1	0.2	2.9	4.5	40 44.96	0.11	17.69	19 40 27.16	2.41
	λ Ursæ Minoris	50	. .	. .	. .	. .	. .	. .	50.0	5.0	. .	. .	. .	0 57.50	−14 55.02	−17.69	. . . .	− 91.13

Oct. 26. Image west 0ʳ.10; clamp west.
Image west 0ʳ.23; clamp east.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Oct. 24, 22.0	− 19.13	+ 0.008	− 0.04	+ 0.06
31, 20.5	− 17.65	+ 0.048	− 0.13	− 0.08

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
1877.														m. s.	s.	s.	h. m. s.	s.
Oct. 31	ξ² Capricorni	1	35.8	37.3	39.9	52.2	54.8	55.5	57.2	58.7	10.9	13.5	15.2	5 55.55	− 0.05	−17.67	20 5 37.83	− 3.13
Y.	*+46° 19′	2	. .	. .	. .	27.7	31.4	33.9	49.8	53.5	55.7	58.1	0.9	10 46.38	40.59	17.66	20 9 48.13	1.29
	Lalande 39208	3	1.2	2.7	5.1	17.0	18.6	20.3	22.0	23.5	35.3	37.8	39.5	17 20.27	0.08	17.66	20 17 2.53	2.89
	B. A. C. 7034	4	11.0	12.6	15.3	28.4	30.1	32.0	33.8	35.5	48.6	51.4	53.2	21 31.99	0.03	17.66	20 21 14.30	3.52
	Weisse 610	5	50.2	51.7	54.2	6.3	7.9	9.6	11.2	12.6	24.7	27.3	28.9	26 9.51	0.06	17.65	20 25 51.80	3.13
	B. A. C. 7112	6	45.2	47.4	50.9	8.1	10.1	12.8	15.0	17.4	34.7	38.2	40.8	30 12.78	0.26	17.65	20 29 54.87	− 1.48
	4 Cephei	7	9.4	13.2	18.9	48.8	52.7	57.0	1.0	4.5	34.4	40.6	44.5	41 56.82	0.49	17.64	20 41 38.69	+ 0.06
	*+37° 56′	8	. .	. .	. .	54.9	57.0	59.4	1.4	4.6	. .	. .	. .	46 59.46	0.19	17.64	20 46 41.63	− 2.00
	*+37° 58′	9	. .	. .	. .	35.0	36.8	38.5	40.7	42.6	. .	. .	. .	47 38.72	0.19	17.64	20 47 20.89	2.01
	*+37° 56′	10	16.8	18.8	21.8	. .	. .	. .	. .	. .	0.2	3.3	5.4	47 41.05	0.21	17.64	20 47 23.20	2.01
	*−13° 58′	11	29.0	30.6	33.0	45.3	46.9	48.6	50.4	51.9	4.1	6.7	8.4	53 48.63	0.05	17.63	20 53 30.95	3.41
	Weisse 1359	12	22.9	24.5	27.0	39.3	40.9	42.6	44.3	45.8	58.2	0.8	2.4	54 42.61	0.05	17.63	20 54 24.93	3.42
	ζ Cygni	13	40.4	42.0	44.9	58.7	0.5	2.4	4.4	6.1	19.8	22.6	24.5	8 2.39	0.17	17.62	21 7 44.60	2.45
	Lalande 41419	14	41.1	43.1	46.3	1.5	3.5	5.7	7.8	9.6	25.0	28.2	30.2	13 5.64	0.21	17.62	21 12 47.81	2.22
	*+23° 48′	15	44.3	45.7	47.9	0.9	2.8	4.6	6.4	8.2	20.7	23.0	24.7	19 4.47	0.15	17.61	21 18 46.71	2.69
	O. Arg. N. 22321	16	7.3	11.6	18.8	53.7	57.7	3.0	8.1	12.1	47.0	54.5	59.0	24 2.98	0.59	17.61	21 23 44.78	0.28
	ρ Cygni	17	14.6	16.4	20.0	37.2	39.2	41.6	43.9	45.9	3.0	6.5	8.8	29 41.55	0.25	17.60	21 29 23.70	2.16
	*+36° 59′	18	57.8	59.7	2.9	18.0	20.8	21.8	24.0	25.8	40.6	43.8	45.8	37 21.91	0.20	17.60	21 37 4.11	2.50
	*−24° 13′	19	56.8	58.4	0.9	14.2	15.8	17.8	19.7	21.2	34.4	37.0	38.8	42 17.73	0.03	17.59	21 42 0.11	3.91
	B. A. C. 7616	20	22.3	23.7	26.1	38.1	39.6	41.3	42.9	44.4	56.5	59.0	0.6	46 41.32	0.07	17.59	21 46 23.66	3.47
	O. Arg. S. 21789	21	. .	. .	. .	17.9	19.5	21.0	22.7	24.7	36.0	38.5	39.9	53 27.52	6.96	17.58	21 53 2.98	3.88
	30 Aquarii	22	50.3	51.7	54.0	6.1	7.6	9.2	11.0	12.5	24.5	27.1	28.7	57 9.34	0.06	17.58	21 56 51.70	3.57
	O. Arg. N. 23425	23	50.1	52.7	58.4	. .	. .	. .	. .	. .	47.9	51.5	54.3	2 22.48	0.32	17.58	22 2 4.58	2.27
	*+53° 8′	24	. .	. .	. .	. .	. .	. .	. .	. .	11.1	15.8	18.2	3 15.03	29.11	17.58	22 2 28.34	2.27
	*+37° 42′	25	59.6	1.1	3.6	19.7	22.0	23.8	26.0	27.8	42.6	45.9	48.1	11 23.65	0.20	17.57	22 11 5.88	2.81
	31 Pegasi	26	29.4	30.9	33.4	45.7	47.3	48.9	50.7	52.1	4.4	6.9	8.5	15 48.93	0.11	17.57	22 15 31.25	3.32
	π Aquarii	27	1.8	2.2	5.7	17.7	19.2	20.9	22.6	24.1	36.0	38.6	40.2	19 20.82	0.08	17.56	22 19 3.18	3.53
	*+6° 43′	28	7.3	9.3	11.0	12.5	15.2	. .	15.5	18.2	19.8	21.6	23.8	26 45.42	0.17	17.56	22 26 27.69	3.47
	*+6° 43′	29	. .	. .	. .	42.2	43.9	45.7	47.2	48.7	. .	. .	. .	26 45.54	0.09	17.56	22 26 27.79	3.47
	*+6° 43′	30	26.2	27.7	30.4	. .	. .	. .	. .	. .	0.4	3.0	4.7	26 45.40	0.11	17.56	22 26 27.73	3.47
	η Aquarii	31	4.3	5.7	8.2	20.0	21.5	23.3	25.0	26.7	38.4	41.0	42.6	29 23.34	− 0.08	17.55	22 29 5.71	3.61
	*−14° 18′	32	2.4	4.4	6.3	8.2	10.5	. .	. .	. .	. .	. .	. .	38 6.36	+ 35.09	17.55	22 38 23.90	3.91
	*−14° 18′	33	. .	. .	. .	44.9	46.3	48.1	49.8	51.5	. .	. .	. .	38 48.12	− 0.04	17.55	22 38 30.53	3.91
	*−14° 18′	34	29.0	30.8	33.2	. .	. .	. .	. .	. .	4.4	7.4	9.0	38 48.97	0.06	17.55	22 38 31.36	3.91
Nov. 16	β Aquarii	35	8.2	9.7	12.1	24.2	25.7	27.5	29.0	30.6	42.5	45.0	46.7	25 27.38	0.09	19.17	21 25 8.12	3.19
	Weisse (2) 871	36	49.5	51.5	54.3	8.7	10.5	12.7	14.6	16.4	30.8	33.9	35.8	36 12.61	0.19	19.17	21 35 53.25	2.28
	Weisse 916	37	. .	. .	. .	. .	. .	. .	56.3	58.8	0.3	2.0	3.9	40 0.26	34.30	19.18	21 39 6.78	3.15
	Lalande 42563	38	20.3	22.3	25.2	40.5	42.5	44.6	46.6	48.6	3.6	6.9	9.0	43 44.55	0.21	19.18	21 43 25.16	2.22
	B. A. C. 7614	39	. .	. .	. .	. .	. .	. .	59.9	3.0	5.2	7.4	9.9	47 5.08	44.19	19.18	21 46 1.71	2.22
	*+48° 9′	40	13.3	15.5	19.3	37.0	39.3	41.8	44.3	46.4	4.3	8.3	10.6	52 41.83	0.26	19.19	21 52 22.38	1.94
	O. Arg. N. 23425	41	51.6	53.9	58.0	. .	. .	. .	. .	. .	48.5	52.8	55.2	2 23.33	0.31	19.19	22 2 3.83	1.85
	*+53° 8′	42	15.9	18.3	22.2	. .	. .	. .	. .	. .	12.8	16.6	19.6	2 47.57	0.31	19.19	22 2 28.07	1.85
	θ Aquarii	43	24.1	25.5	28.0	40.1	41.6	43.3	45.0	46.5	58.6	1.0	2.6	10 43.30	0.09	19.20	22 10 24.01	3.48
	47 Aquarii	44	51.5	53.0	55.7	8.9	10.4	12.3	14.0	15.7	28.4	31.1	33.0	15 12.18	0.07	19.20	22 14 52.91	3.77
	ζ Pegasi	45	22.9	24.4	26.8	39.1	40.6	42.3	44.0	45.6	57.6	0.2	1.8	35 42.30	0.12	19.20	22 35 22.98	3.28
	α Pegasi	46	41.1	42.6	45.2	57.5	59.1	0.9	2.5	4.0	16.0	19.0	20.7	59 0.78	0.13	19.23	22 58 41.42	3.38
	*−6° 11′	47	. .	. .	. .	54.0	55.5	57.2	58.8	0.3	12.4	14.9	16.5	12 3.70	6.60	19.23	23 11 37.87	3.74
	*−5° 24′	48	47.7	49.1	51.6	3.7	5.2	7.0	8.6	10.0	21.9	24.5	26.0	15 6.85	0.09	19.24	23 14 47.52	3.74
	*+15° 12′	49	16.4	17.8	20.5	32.7	34.4	36.0	37.7	39.2	51.9	54.3	55.9	25 36.07	0.13	19.24	23 25 16.70	3.56
	75 Pegasi	50	47.1	48.7	51.2	3.7	5.3	7.1	8.9	10.4	22.9	25.6	27.3	32 7.11	− 0.14	−19.25	23 31 47.72	− 3.58

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1870. h.	s.	s.	s.	s.
Nov. 16, 23.1	− 19.23	− 0.037	− 0.10	− 0.10

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
877.														m. s.	s.	s.	h. m. s.	s.
v. 16 Y.	*+63° 26′ . . .	1	10.5	14.0	19.5	46.1	49.7	53.4	57.2	0.6	27.0	33.0	36.6	41 53.42	− 0.42	−19.25	23 41 33.75	− 3.38
	Groombridge 4163	2	. .	. .	. .	3.8	9.5	15.6	21.5	26.7	. .	. .	. .	49 15.42	0.66	19.26	23 48 55.50	3.62
	B. A. C. 8355 (1st *)	3	12.0	16.5	20.5	23.8	30.4	. .	54.9	1.0	4.5	8.9	13.6	56 42.61	0.53	19.26	23 56 22.82	3.74
	B. A. C. 8355 (2d *)	4	58.7	2.2	8.2	36.7	40.6	44.5	48.5	52.3	20.7	27.0	30.8	56 44.56	0.46	19.26	23 56 24.84	3.74
	Weisse 1218 . .	5	38.2	39.6	42.0	53.9	55.5	57.0	58.7	0.3	12.2	14.8	16.3	0 57.14	0.10	19.26	0 0 37.78	3.89
	γ Pegasi	6	57.7	59.3	1.7	14.0	15.6	17.4	19.0	20.6	33.9	35.6	37.1	7 17.45	0.13	19.27	0 6 58.05	3.84
	*+44° 12′ . . .	7	. .	. .	. .	30.0	32.2	34.3	36.6	38.7	. .	. .	. .	15 34.36	0.23	19.27	0 15 14.86	3.90
	Radcliffe 79 . .	8	57.8	59.8	3.2	19.8	22.2	24.6	26.7	28.7	45.6	48.9	51.3	16 24.42	0.24	19.27	0 16 4.91	3.91
	49 Piscium . . .	9	27.4	29.0	31.5	43.8	45.4	47.2	48.9	50.5	2.8	5.5	7.1	24 47.19	0.13	19.28	0 24 27.78	3.95
	*+33° 3′ . . .	10	57.1	59.3	1.4	3.1	6.4	. .	18.2	21.2	23.0	25.0	27.3	30 12.20	0.28	19.28	0 29 52.64	4.00
	Weisse (2) 749 .	11	19.7	21.5	24.4	38.7	40.6	42.6	44.6	46.4	0.6	3.7	5.5	30 42.57	0.19	19.28	0 30 23.10	4.01
	B. A. C. 197 . .	12	32.2	34.4	38.1	55.6	58.0	0.5	3.0	5.2	22.5	26.2	28.6	38 0.39	0.26	19.29	0 37 40.84	4.21
	61 Piscium . . .	13	26.6	28.2	30.8	43.5	45.1	46.9	48.7	50.3	2.9	5.7	7.3	41 46.91	0.14	19.29	0 41 27.48	4.06
	*+36° 15′ . . .	14	10.1	11.7	14.9	29.8	31.6	33.7	35.7	37.6	52.5	55.5	57.5	46 33.69	0.20	19.29	0 46 14.20	4.18
	Lacaille 276 . .	15	. .	. .	. .	51.6	53.5	55.6	57.4	59.3	. .	. .	. .	55 55.48	0.18	19.30	0 55 36.00	4.45
	29 Ceti.	16	43.6	45.0	47.6	59.5	1.1	2.8	4.4	5.9	17.8	20.2	21.9	2 2.71	0.10	19.30	1 1 43.31	4.17
	Weisse 91 . . .	17	53.3	54.7	57.1	9.1	10.6	12.2	13.9	15.4	27.3	29.8	31.6	8 12.27	0.10	19.31	1 7 52.86	4.20
	Polaris	18	. .	. .	. .	36.0	44.0	57.0	7.0	13.0	. .	. .	. .	14 55.40	8.19	19.31	. . . .	45.70
	η Piscium . . .	19	58.2	59.7	2.3	14.6	16.0	17.9	19.5	21.1	33.4	36.0	37.7	25 17.85	0.13	19.31	1 24 58.41	4.31
17	μ Aquarii . . .	20	3.8	5.3	7.8	19.9	21.6	23.2	24.8	26.3	38.4	41.0	42.7	46 23.16	0.07	19.00	20 46 4.09	3.04
	18 Delphini . . .	21	32.8	34.2	36.7	48.9	50.5	52.2	53.9	55.5	7.5	10.2	11.7	52 52.19	0.13	19.00	20 52 33.06	2.60
	12 Aquarii (1st *) .	22	. .	. .	. .	53.1	54.7	56.4	58.0	59.4	. .	. .	. .	57 56.32	0.07	18.99	20 57 37.26	3.02
	12 Aquarii (2d *) .	23	37.0	38.6	41.1	. .	. .	. .	. .	. .	11.5	14.0	15.7	57 56.32	− 0.09	18.99	20 57 37.24	3.02
	Lacaille 8719 . .	24	8.3	10.5	13.6	29.2	31.3	33.4	35.5	37.4	53.0	56.5	58.4	5 33.37	+ 0.01	18.99	21 5 14.39	3.94
	Lacaille 8760 . .	25	1.0	2.8	6.2	21.6	23.4	25.6	27.9	29.8	45.1	48.4	50.6	10 25.67	+ 0.01	18.98	21 10 6.70	3.95
	Weisse 357 . .	26	8.7	10.2	12.8	25.1	26.7	28.3	30.0	31.4	43.7	46.4	47.8	17 28.28	− 0.07	18.98	21 17 9.23	3.24
	Weisse 364 . .	27	. .	. .	. .	13.2	15.8	17.4	28.6	31.2	32.7	34.5	36.6	18 26.25	28.46	18.98	21 17 38.81	3.24
	*+36° 9′ . . .	28	12.0	13.7	17.0	31.8	33.7	35.9	37.7	39.7	54.4	57.6	59.5	20 35.73	0.25	18.98	21 20 16.50	2.03
	β Aquarii . . .	29	8.0	9.6	12.0	23.9	25.5	27.2	28.9	30.4	42.4	45.0	46.5	25 27.22	− 0.08	18.97	21 25 8.17	3.18
	ρ Cygni	30	15.4	17.6	21.0	37.9	40.0	42.3	44.8	46.7	. .	. .	. .	29 33.21	+ 8.75	18.97	21 29 22.99	1.76
	*−24° 13′ . . .	31	57.8	59.3	1.9	15.7	17.0	18.7	20.4	22.2	35.4	38.2	39.8	42 18.76	− 0.03	18.96	21 41 59.77	3.67
	B. A. C. 7616 . .	32	23.2	24.8	27.2	39.1	40.7	42.4	44.1	45.7	57.6	0.1	1.7	46 42.42	0.09	18.96	21 46 23.37	3.25
	*+8° 49′ . . .	33	13.0	15.2	18.8	36.8	39.1	41.6	44.0	46.4	4.1	7.9	10.3	52 41.56	0.13	18.96	21 52 22.47	3.01
	Lacaille 9012 . .	34	37.6	39.4	42.0	55.8	57.7	59.4	1.2	2.9	16.7	19.5	21.4	57 59.42	0.02	18.95	21 57 40.45	3.86
	B. A. C. 7702 . .	35	13.5	15.4	18.5	32.9	34.7	36.7	38.6	40.6	55.2	58.2	0.1	1 36.70	0.00	18.95	22 1 17.81	4.03
	B. A. C. 7744 . .	36	22.8	24.3	26.7	38.7	40.2	42.0	43.5	45.1	57.2	59.6	1.2	6 41.94	0.09	18.95	22 6 22.90	3.38
	θ Aquarii . . .	37	23.7	25.3	27.8	39.8	41.4	43.1	44.8	46.2	58.2	0.8	2.4	10 43.05	0.08	18.94	22 10 24.03	3.47
	2 Lacertæ . . .	38	50.8	53.1	56.8	13.8	16.1	18.4	20.9	22.9	40.0	42.4	46.1	16 18.30	0.32	18.94	22 15 59.04	2.30
	*+38° 33′ . . .	39	12.4	13.9	17.0	. .	. .	. .	. .	. .	55.8	59.0	1.1	20 36.53	0.27	18.94	22 20 17.32	2.57
	*+38° 33′ . . .	40	21.5	23.3	26.4	. .	. .	. .	. .	. .	5.0	8.5	10.4	20 45.85	0.27	18.94	22 20 20.64	2.58
	*+39° 9′ . . .	41	38.8	40.6	43.8	. .	. .	. .	. .	. .	22.9	26.1	28.1	27 3.38	0.28	18.93	22 26 44.17	2.63
	B. A. C. 7858 . .	42	57.4	59.2	2.5	. .	. .	. .	. .	. .	41.5	44.7	46.9	27 22.03	0.28	18.93	22 27 2.82	2.63
	9 Lacertæ . . .	43	10.9	13.2	17.0	36.0	38.4	41.0	43.7	46.1	4.8	8.9	11.5	32 41.05	0.36	18.93	22 32 21.76	2.35
	19 Piscis Australis .	44	. .	. .	. .	50.7	52.3	54.2	56.2	58.0	11.6	14.6	16.5	36 1.76	7.49	18.93	22 35 35.34	4.04
	*+50° 52′ . . .	45	. .	. .	. .	24.7	27.3	29.9	32.6	34.9	. .	. .	. .	39 29 88	0.34	18.92	22 39 10.62	2.46
	*+50° 47′ . . .	46	15.2	17.6	21.5	40.5	43.0	45.5	48.0	50.4	9.3	13.3	15.8	40 45.46	0.36	18.92	22 40 26.18	2.48
	*+65° 23′ . . .	47	16.9	20.3	26.3	55.0	58.4	2.7	6.8	10.0	38.7	44.6	48.6	45 2.57	0.61	18.92	22 44 43.04	1.91
	Lacaille 9315 (1st *)	48	. .	. .	. .	. .	. .	. .	. .	. .	45.3	48.0	49.7	51 47.67	19.38	18.92	22 51 9.37	4.02
	Lacaille 9315 (2d *)	49	. .	. .	. .	24.8	26.7	28.6	30.3	32.0	. .	. .	. .	51 28.48	0.01	18.92	22 51 9.55	4.02
	*−6° 36′ . . .	50	34.8	36.2	38.7	50.8	52.3	54.0	55.5	57.1	9.1	11.7	13.4	55 53.96	− 0.08	−18.91	22 55 34.97	− 3.66

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1877. h.	s.	s.	s.	s.
Nov. 17, 22.5	− 18.93	+ 0.041	− 0.17	− 0.10

Date and observer.	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed Right Ascension.	Reduction to 1877.0.
1877.														m. s.	s.	s.	h. m. s.	s.
Nov. 17	Lalande 45323 .	1	7.5	9.3	12.6	27.6	29.5	31.7	33.8	35.8	50.9	54.2	56.3	3 31.75	− 0.26	−18.91	23 3 12.58	− 3.06
Y.	Weisse 61 . . .	2	. .	. .	. .	15.7	18.3	20.0	31.1	33.6	35.2	37.0	38.9	6 28.72	28.27	18.91	23 5 41.54	3.50
	*−6° 11′ . . .	3	27.8	29.4	31.8	. .	. .	. .	. .	. .	2.3	4.7	6.4	11 47.07	0.09	18.90	23 11 28.08	3.73
	*−6° 7′ . . .	4	37.6	39.0	41.4	. .	. .	. .	. .	. .	11.9	14.5	16.2	11 56.77	0.09	18.90	23 11 37.78	3.73
	*−5° 24′ . . .	5	47.5	48.9	51.3	3.3	4.8	6.4	8.1	9.7	21.7	24.1	25.8	15 6.51	0.08	18.90	23 14 47.53	3.73
	Weisse 359 . .	6	9.8	11.2	13.7	25.6	27.1	28.9	30.5	32.1	44.0	46.6	48.3	19 28.89	0.12	18.90	23 19 9.87	3.62
	*+15° 12′ . . .	7	16.2	17.5	19.9	32.6	34.0	35.9	37.4	38.9	51.3	53.8	55.9	25 35.76	0.15	18.89	23 25 16.72	3.54
	Weisse (2) 639. .	8	57.2	59.0	2.0	. .	. .	. .	. .	. .	38.7	42.0	44.1	31 20.50	0.25	18.89	23 31 1.36	3.40
	Weisse (2) 658. .	9	21.5	23.2	26.2	. .	. .	. .	. .	. .	3.2	6.4	8.4	31 44.82	0.25	18.89	23 31 25.68	3.40
	γ Cephei	10	. .	. .	. .	27.4	34.5	41.3	48.9	55.7	. .	. .	. .	34 41.56	1.16	18.89	. . . .	2.89
	B. A. C. 8280 . .	11	37.8	40.8	45.5	9.0	12.1	15.2	18.5	21.4	44.8	49.7	53.0	43 15.25	0.48	18.88	23 42 55.89	3.39
	Lalande 46836 .	12	48.9	51.7	53.9	9.1	11.1	13.2	15.3	17.2	32.6	35.7	37.9	48 13.33	0.26	18.88	23 47 54.19	3.56
	ω Piscium . . .	13	3.3	4.8	7.3	19.3	20.9	22.5	24.2	25.8	37.6	40.2	41.9	53 22.53	0.12	18.87	23 53 3.54	3.81
	Lacaille 9707 . .	14	42.0	43.8	46.8	1.6	3.5	5.4	7.4	9.3	24.1	26.9	29.2	57 5.45	0.00	18.87	23 56 46.58	4.40
	Weisse 1218 . .	15	37.6	39.0	41.6	53.5	55.1	56.6	58.3	59.8	11.7	14.4	16.0	0 56.69	0.10	18.87	0 0 37.72	3.89
	γ Pegasi	16	57.4	58.9	1.4	13.8	15.3	17.1	18.7	20.4	32.6	35.3	36.9	7 17.07	0.15	18.86	0 6 58.06	3.84
	Lalande 231 . .	17	27.8	29.7	33.0	48.3	50.2	52.5	54.7	56.6	11.7	15.1	17.1	10 52.43	0.27	18.86	0 10 33.30	3.81
	*+44° 12′ . . .	18	7.5	9.6	12.7	29.6	31.7	33.8	36.3	38.5	55.1	58.6	0.8	15 33.82	0.31	18.86	0 15 14.65	3.88
	Lalande 489 . .	19	34.4	36.3	39.4	54.9	56.6	58.8	0.9	2.7	17.9	21.2	23.2	18 58.75	0.26	18.86	0 18 39.63	3.90
	*+15° 22′ . . .	20	22.5	24.0	26.4	. .	. .	. .	. .	. .	57.8	0.2	2.2	22 42.18	0.16	18.85	0 22 23.17	3.93
	*+15° 22′ . . .	21	45.2	46.7	49.2	. .	. .	. .	. .	. .	20.6	23.3	24.9	23 4.98	0.16	18.85	0 22 45.97	3.93
	49 Piscium . . .	22	26.9	28.5	31.0	43.3	44.9	46.7	48.3	50.0	2.3	4.9	6.6	24 46.67	0.15	18.85	0 24 27.67	3.94
19	μ Aquarii. . . .	23	4.2	5.8	8.3	20.5	22.0	23.7	25.3	26.8	38.9	41.4	43.0	46 23.63	0.08	19.46	20 46 4.09	3.01
	Lacaille 8760 . .	24	1.5	3.5	6.7	22.1	24.0	26.3	28.3	30.2	45.7	49.0	51.0	10 26.21	0.00	19.48	21 10 6.73	3.82
	μ Capricorni. . .	25	28.6	40.2	42.7	55.1	56.7	58.5	0.2	1.6	13.8	16.5	18.0	46 58.35	− 0.07	19.51	21 46 38.77	3.45
	*−20° 37′ . . .	26	45.3	46.8	49.6	2.6	4.0	5.8	7.5	9.4	. .	. .	. .	49 58.88	+ 6.87	19.51	21 49 46.24	3.59
	*−20° 37′ . . .	27	32.3	33.6	36.3	49.1	50.6	52.4	54.0	56.0	8.5	11.1	12.9	52 52.44	− 0.05	19.51	21 52 32.88	3.60
	Weisse (2) 349 .	28	. .	. .	. .	1.0	3.0	5.7	7.9	10.0	23.4	26.9	29.1	17 13.38	− 8.32	19.54	22 16 45.52	2.55
	*+38° 33′ . . .	29	49.8	51.7	53.6	55.7	58.7	. .	. .	. .	. .	. .	. .	19 53.90	+ 43.26	19.55	22 20 17.61	2.54
	*+38° 33′ . . .	30	21.5	23.1	26.1	. .	. .	. .	. .	. .	6.1	8.8	11.1	20 46.12	− 0.29	19.55	22 20 26.28	2.54
	η Aquarii. . . .	31	6.1	7.6	10.0	21.9	23.5	25.2	26.8	28.2	40.1	42.6	44.5	29 25.14	− 0.11	19.55	22 29 5.48	3.40
	Lalande 44848. .	32	58.5	0.3	3.3	. .	. .	. .	. .	. .	. .	. .	. .	49 0.70	+ 20.89	19.56	22 49 2.03	2.92
	*+35° 19′ . . .	33	14.7	16.3	19.6	. .	. .	. .	. .	. .	56.9	0.0	2.0	49 38.25	− 0.27	19.56	22 49 18.42	2.93
	*+35° 18′ . . .	34	. .	. .	. .	. .	. .	. .	18.2	21.4	23.4	25.6	27.9	50 23.30	42.16	19.56	22 49 21.58	2.93
	B. A. C. 8139 . .	35	21.6	23.4	26.7	41.7	43.8	45.8	47.9	49.8	5.0	8.2	10.0	15 45.81	0.27	19.58	23 15 25.96	3.17
	Weisse (2) 639. .	36	57.8	59.6	2.5	. .	. .	. .	. .	. .	39.7	42.6	44.7	31 21.15	0.27	19.59	23 31 1.29	3.37
	Weisse (2) 658. .	37	22.3	24.0	26.9	. .	. .	. .	. .	. .	4.3	7.0	9.1	31 45.60	0.27	19.59	23 31 25.74	3.37
	γ Cephei	38	. .	. .	. .	48.9	0.0	7.7	55.9	6.6	14.6	21.3	29.9	36 45.62	2 4.63	19.60	. . . .	2.75
	*+34° 19′ . . .	39	32.2	34.0	37.0	51.5	53.4	55.3	57.3	59.3	13.5	16.7	18.6	46 55.35	0.27	19.61	23 46 35.47	3.54
	ι Ceti.	40	5.1	6.7	9.3	21.8	23.4	25.3	27.0	28.5	41.0	43.5	45.2	52 25.16	0.06	19.61	23 52 5.49	4.03
	B. A. C. 8355 (1st *)	41	12.0	16.9	20.8	24.0	30.5	. .	55.3	1.2	5.1	9.0	14.0	56 42.88	0.76	19.61	23 56 22.51	3.63
	B. A. C. 8355 (2d *)	42	59.0	2.7	3.4	37.0	40.7	44.6	49.1	52.6	21.5	27.1	31.7	56 44.95	0.59	19.61	23 56 24.75	3.63
	γ Pegasi	43	58.0	59.5	2.0	14.5	16.0	17.8	19.5	21.0	33.3	36.0	37.8	7 17.76	0.16	19.62	0 6 57.98	3.82
	θ Andromedæ . .	44	39.5	41.3	44.6	59.6	1.5	3.7	5.7	7.7	22.6	25.9	28.2	11 3.66	0.27	19.63	0 10 43.76	3.79
	Radcliffe 65 . .	45	. .	. .	. .	17.6	20.0	22.2	24.2	26.5	. .	. .	. .	14 22.10	0.31	19.63	0 14 2.16	3.84
	Radcliffe 73 . .	46	37.2	39.3	42.7	59.5	1.5	3.8	6.1	8.2	25.0	28.3	30.6	15 3.84	0.32	19.63	0 14 43.89	3.85
	55 Piscium . . .	47	30.5	32.2	34.8	47.5	49.1	51.0	52.7	54.5	7.0	9.8	11.5	33 50.96	0.18	19.65	0 33 31.13	3.99
	β Ceti.	48	28.6	30.2	32.8	45.4	47.1	48.8	50.5	52.1	4.6	7.5	9.0	37 48.78	− 0.06	19.65	0 37 29.07	4.20
Dec. 14	η Aquarii. . . .	49	14.7	16.5	19.0	30.9	32.4	34.1	35.7	37.3	49.0	51.6	53.0	29 34.02	+ 0.16	28.93	22 29 5.25	3.14
	ζ Pegasi	50	31.9	33.7	36.2	48.1	49.7	51.4	53.0	54.6	6.7	9.4	11.0	35 51.43	+ 0.10	−28.93	22 35 22.60	− 2.97

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Nov. 19, 22.8	− 19.56	− 0.049	− 0.17	− 0.11
Dec. 14, 23.7	− 28.92	+ 0.008	− 0.38	+ 0.16

Nov. 20. Image east $0^{r}.00$; clamp east.
Image east $0^{r}.21$; clamp west.

	OBJECT.	Number.	SECONDS OF TRANSIT OVER WIRES.												CORRECTIONS.		Observed Right Ascension.	Reduction to 1877.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
7.														m. s.	s.	s.	h. m. s.	s.
14	Lalande 44918.	1	2.0	4.5	7.6	23.2	25.0	27.1	29.2	31.2	46.6	49.6	51.6	52 27.06	− 0.10	−28.93	22 51 58.03	− 2.46
	Lalande 44922.	2	..	..	..	..	..	..	9.6	13.1	15.0	17.0	19.6	53 14.86	− 43.71	28.93	22 52 2.22	2.46
	Lacaille 9373	3	25.9	27.7	30.7	44.5	46.3	48.2	50.3	52.0	5.9	8.7	10.5	0 48.25	+ 0.41	28.93	23 0 19.73	3.76
	Lalande 45588.	4	10.8	12.8	16.1	31.1	32.9	35.0	37.0	38.9	53.6	57.0	58.9	11 34.92	− 0.09	28.92	23 11 5.91	2.73
	Lacaille 9458	5	18.8	20.6	23.6	37.7	39.5	41.2	43.2	45.0	59.2	2.1	3.9	17 41.34	+ 0.42	28.92	23 17 12.84	3.83
	11 Piscium	6	21.1	22.7	25.3	37.2	38.7	40.2	42.0	43.5	55.6	58.0	59.5	23 40.34	0.19	28.92	23 23 11.61	3.46
	Lacaille 9516	7	4.4	6.2	9.2	23.3	25.2	27.1	29.1	30.9	44.9	47.8	49.6	27 27.06	0.42	28.92	23 26 58.56	3.87
	75 Pegasi	8	56.2	58.1	0.5	13.0	14.5	16.4	18.0	19.6	32.3	34.9	36.5	32 16.36	0.04	28.92	23 31 47.48	3.27
	Lalande 46496 (1st*)	9	53.2	54.8	57.3	9.4	10.9	12.5	14.0	15.7	..	..	..	38 5.98	+ 6.64	28.92	23 37 43.70	3.44
	Lalande 46496 (2d *)	10	..	..	..	27.8	30.3	31.8	42.9	45.4	46.9	48.4	50.2	38 40.46	− 27.82	28.92	23 37 43.72	3.44
	Lacaille 9620	11	23.7	25.7	28.7	43.5	45.1	47.3	49.0	51.1	5.8	8.8	10.7	45 47.22	+ 0.47	28.92	23 45 18.77	3.97
	Lacaille 9641	12	50.8	52.6	54.8	11.1	13.0	15.2	17.0	19.1	34.4	37.6	39.4	49 15.00	0.50	28.92	23 48 46.58	4.03
	ω Piscium	13	12.8	14.4	16.8	28.9	30.5	32.1	33.8	35.2	47.1	49.7	51.2	53 32.05	0.12	28.92	23 53 3.25	3.56
	Lacaille 9706	14	12.6	14.6	17.6	31.4	33.2	34.8	36.9	38.7	52.5	55.2	57.1	58 34.96	0.40	28.92	23 58 6.44	3.93
	Weisse 21	15	46.4	48.0	50.5	2.6	4.2	5.9	7.7	9.1	21.3	23.9	25.4	4 5.91	0.08	28.92	0 3 37.07	3.58
	γ Pegasi	16	6.8	8.4	10.9	23.5	24.9	26.6	28.3	29.8	42.1	44.7	46.4	7 26.58	+ 0.06	28.92	0 6 57.72	3.58
	Radcliffe 79	17	..	..	..	29.0	30.9	33.0	35.4	37.8	54.3	57.8	0.0	16 42.28	− 9.19	28.92	0 16 4.17	3.48
	*+15° 22′	18	54.9	56.6	59.2	11.5	13.1	14.7	16.4	18.2	30.4	33.0	34.5	23 14.77	+ 0.06	28.91	0 22 45.92	3.70
	49 Piscium	19	36.5	38.2	40.8	53.0	54.7	56.4	58.0	59.6	12.1	14.9	16.4	24 56.42	+ 0.06	28.91	0 24 27.57	3.72
	π Andromedæ	20	6.3	8.5	10.8	12.3	..	..	..	30.2	32.0	34.0	36.4	30 51.31	0.00	28.91	0 30 22.40	3.71
	Weisse (2) 749.	21	29.0	30.8	33.8	48.0	50.0	52.0	53.7	55.7	9.8	13.0	14.6	30 51.86	− 0.06	28.91	0 30 22.89	3.71
	Polaris	22	..	..	..	36.0	40.0	48.0	58.0	6,0	..	..	..	14 49.60	− 9.03	28.91	. . . .	29.26
	η Piscium	23	7.4	9.0	11.6	23.9	25.5	27.2	28.9	30.4	42.8	45.5	47.0	25 27.20	+ 0.06	28.91	1 24 58.35	4.18
15	η Aquarii.	24	15.9	17.4	19.9	31.8	33.3	35.0	36.7	38.2	50.0	52.6	54.2	29 35.00	− 0.19	29.59	22 29 5.22	3.13
	ζ Pegasi	25	33.0	34.6	37.0	49.1	50.7	52.4	54.0	55.6	7.7	10.3	11.8	35 52.38	0.21	29.59	22 35 22.58	2.96
	Lacaille 9265	26	23.0	24.6	27.3	40.5	42.3	44.2	46.0	47.8	1.0	3.8	5.6	41 44.19	0.17	29.59	22 41 14.43	3.61
	Lacaille 9301	27	14.5	16.2	19.3	33.2	35.2	37.2	39.0	40.9	55.0	57.9	59.9	49 37.12	0.17	29.59	22 49 7.36	3.74
	Lalande 44918	28	3.7	5.5	8.8	24.1	26.0	28.0	30.1	32.3	47.4	50.7	52.7	52 28.12	0.32	29.59	22 51 58.21	2.44
	Lalande 44922	29	..	..	..	..	..	..	11.0	14.3	16.0	18.2	20.9	53 16.08	44.11	29.59	22 52 2.38	2.44
	Lacaille 9373	30	27.2	28.7	31.8	45.6	47.4	49.3	51.3	53.3	6.8	9.7	11.8	0 49.35	0.17	29.59	23 0 19.59	3.75
	7 Andromedæ	31	58.4	0.6	4.5	22.4	25.0	27.4	30.0	32.4	50.2	54.0	57.0	7 27.45	0.39	29.58	23 6 57.48	2.31
	Lacaille 9444	32	14.0	15.9	18.8	33.1	35.1	36.9	39.0	40.8	55.4	58.4	0.3	13 37.06	0.17	29.58	23 13 7.31	3.85
	Lacaille 9458	33	20.1	21.8	24.8	38.9	40.8	42.6	44.4	46.3	0.4	3.2	5.3	17 42.60	0.17	29.58	23 17 12.85	3.82
	11 Piscium	34	22.2	23.7	26.2	38.1	39.7	41.4	43.0	44.6	56.5	58.9	0.6	23 41.35	0.19	29.58	23 23 11.58	3.45
	Lacaille 9516	35	5.6	7.4	10.1	24.4	26.1	28.3	30.2	31.9	45.9	49.0	50.9	27 28.16	0.17	29.58	23 26 58.41	3.85
	75 Pegasi	36	57.3	58.8	1.4	14.0	15.6	17.4	19.0	20.7	33.2	35.9	37.5	32 17.35	0.23	29.58	23 31 47.54	3.26
	O. Arg. S. 23052	37	2.3	3.8	6.4	18.9	20.5	22.2	24.0	25.6	38.2	40.7	42.5	42 22.28	0.17	29.58	23 41 52.53	3.71
	Lacaille 9620	38	24.8	26.8	29.7	44.3	46.1	48.3	50.3	52.2	6.9	9.9	12.1	45 48.31	0.17	29.58	23 45 18.56	3.96
	ω Piscium	39	3.9	5.4	7.8	29.7	31.3	33.0	34.6	36.2	48.1	50.9	52.5	53 33.04	0.20	29.58	23 53 3.26	3.55
	Lacaille 9702	40	4.8	6.2	8.9	22.2	23.7	25.6	27.5	29.2	42.5	45.3	47.0	57 25.72	0.17	29.58	23 56 55.97	3.86
	B. A. C. 10	41	16.5	18.0	21.0	34.6	36.3	37.9	40.1	41.9	55.5	58.3	0.2	3 38.21	0.17	29.58	0 3 8.46	3.92
	γ Pegasi	42	7.8	9.4	11.9	24.2	25.8	27.6	29.3	30.9	43.1	45.7	47.4	7 27.55	0.22	29.58	0 6 57.75	3.57
	σ Andromedæ	43	4.0	5.8	8.9	23.7	25.5	27.6	29.6	31.6	46.2	49.4	51.3	12 27.60	0.30	29.58	0 11 57.72	3.47
	9 Ceti	44	47.5	49.0	51.6	3.7	5.3	7.0	8.7	10.3	21.5	25.1	26.8	17 6.95	0.17	29.58	0 16 37.20	3.79
	48 Piscium	45	2.9	4.6	7.2	19.4	21.0	22.8	24.6	26.2	38.4	41.0	42.8	22 22.81	0.18	29.57	0 21 53.06	3.68
	52 Piscium	46	21.9	23.5	26.2	38.8	40.4	42.1	44.0	45.6	58.0	0.8	2.4	26 42.15	0.23	29.57	0 26 12.35	3.70
	Lalande 884	47	..	..	..	59.7	1.7	3.8	5.7	7.7	22.7	25.8	27.8	30 11.86	8.48	29.57	0 29 33.81	3.68
	Lalande 1003	48	8.4	10.3	13.2	28.0	30.0	32.0	34.1	35.9	50.6	53.8	55.9	33 32.02	0.31	29.57	0 33 2.14	3.73
	λ Sculptoris	49	56.9	58.6	1.8	17.2	19.0	21.4	23.5	25.4	40.7	42.2	46.1	37 21.16	0.17	29.57	0 36 51.42	4.13
	58 Piscium	50	50.8	52.3	54.9	6.9	8.4	10.1	11.8	13.4	25.4	28.0	29.7	41 10.15	0.21	29.57	0 40 40.37	3.84
	Weisse 732	51	..	..	..	25.7	28.2	29.8	40.9	43.4	44.9	46.6	48.8	44 38.54	− 28.05	29.57	0 43 40.92	4.15
	Polaris	52	14.0	16.0	4.0	..	..	..	..	..	..	..	..	2 31.33	+12 9.37	29.57	. . . .	28.57
	θ Ceti	53	7.0	8.7	11.0	23.0	24.7	26.4	28.0	29.6	41.6	44.2	45.8	18 26.36	− 0.17	−29.57	1 17 56.62	− 4.07

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1877. h.	s.	s.	s.	s.
Dec. 15, 23.7	− 29.58	+ 0.008	− 0.09	− 0.19

Dec. 15. Image east $0^{r}.41$; clamp west.
Image east $0^{r}.00$; clamp east.

OBSERVATIONS

WITH THE

MURAL CIRCLE.

1877.

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. Jan. 26	1	Polaris	. .	3	II–V–VII	330 15 4.0	4.5	13.5	7.1	12.1	3.0	7.35	30.626	30.746	29.879
	2	Nadir	. .	.	. .	199 59 58.0	59.8	63.9	59.9	63.1	59.4	60.68	30.624	. .	. .
	3	Lacaille 745 . . .	. .	3	III–VII	93 20 3.4	5.7	8.8	6.3	11.1	3.3	6.43	35.920	. .	35.181
	4	Lalande 4903 . .	. .	3	V–IX	44 35 3.9	5.1	9.1	3.2	10.8	3.8	5.98	34.135	. .	33.383
	5	B. A. C. 900 . . .	. .	3	III–VII	100 40 5.1	5.9	10.1	5.4	10.6	4.6	6.95	27.799	. .	27.062
	6	Anon. $3^h 5^m 12^s$ . .	8.5	2	V, VII	20 25 0.2	2.5	6.2	2.2	7.8	0.0	3.15	35.002	. .	34.250
	7	Anon. $3^h 5^m 29^s$ . .	8.5	2	VII, IX	“ “ “	“	“	“	“	“	“	34.657	30.746	33.886
29	8	64 Andromedæ . . .	5.5	3	III–VII	9 25 4.3	7.0	10.1	6.9	12.6	6.4	7.88	27.737	30.629	27.106
	9	Lacaille 749 . . .	. .	3	V–IX	93 14 57.8	58.8	60.9	57.6	62.3	60.3	59.61	35.668	. .	35.053
	10	Lalande 4903 . .	. .	3	III–VII	44 34 48.8	51.0	54.2	50.0	56.2	52.9	52.18	33.480	. .	32.849
	11	Anon. $2^h 59^m 44^s$.	. .	3	IV–VI	8 10 2.8	3.4	7.2	4.5	9.0	4.1	5.17	26.975	. .	26.342
	12	B. A. C. 1005 . . .	5.5	3	III–VII	89 10 3.2	5.2	7.3	3.6	9.8	5.9	5.83	36.511	. .	35.888
	13	Nadir	. .	.	. .	200 0 59.5	62.3	65.8	64.1	65.7	63.2	63.43	30.590	30.629	. .
30	14	ξ^1 Ceti	. .	3	III–VII	50 35 4.8	5.2	9.1	5.1	12.2	9.2	7.60	27.403	30.644	26.758
	15	64 Andromedæ . . .	. .	3	III–VII	9 25 3.8	6.1	8.2	4.6	10.5	4.9	6.35	27.702	. .	27.047
	16	Lacaille 749 . . .	5.5	3	III–VII	93 15 1.2	2.4	5.0	2.2	7.2	3.5	3.58	35.922	. .	35.285
	17	Lalande 4903. . .	. .	3	V–IX	44 35 6.2	7.5	11.1	7.2	13.1	8.9	9.00	34.034	. .	33.385
	18	B. A. C. 900 . . .	6.5	3	III–VII	100 40 1.3	1.5	4.2	0.8	5.4	1.9	2.52	27.530	. .	26.895
	19	Anon. $2^h 59^m 44^s$.	. .	3	III–VII	8 10 4.1	4.8	8.9	5.0	10.2	5.0	6.33	27.029	. .	26.373
	20	B. A. C. 840 . . .	6.0	3	V–IX	97 44 55.8	58.5	61.2	55.8	63.8	58.2	58.88	32.801	. .	32.174
	21	B. A. C. 1005 . . .	. .	3	III–VII	89 5 7.1	8.2	10.1	7.0	12.4	8.9	8.95	27.117	. .	26.479
	22	O. Arg. S. 2245 . .	6.5	3	III–VII	80 15 0.0	1.8	4.9	0.3	6.9	2.0	2.65	32.635	. .	31.995
	23	Anon. $3^h 28^m$. . .	9.0	3	III–VII	27 25 2.7	5.5	8.2	4.2	9.8	6.2	6.10	29.538	. .	28.888
	24	Anon. $3^h 29^m$. . .	7.5	2	VII, IX	“ “ “	“	“	“	“	“	“	26.648	. .	25.985
	25	Weisse (2) III, 776 .	8.5	2	VIII, IX	13 55 2.2	3.9	5.6	0.6	8.1	4.2	4.10	29.765	. .	29.082
	26	Weisse (2) III, 847 .	8.0	2	VII, IX	“ “ “	“	“	“	“	“	“	30.574	. .	29.899
	27	Anon. $3^h 53^m 57^s$.	9.5	1	V	23 50 0.3	0.9	3.3	0.0	5.6	1.1	1.87	28.803	. .	28.159
	28	Anon. $3^h 54^m 40^s$.	8.5	3	V–IX	“ “ “	“	“	“	“	“	“	30.218	. .	29.599
	29	Anon. $4^h 11^m 33^s$.	8.2	3	III–VII	41 25 2.8	4.1	7.7	4.9	10.9	6.0	6.07	35.338	. .	34.691
	30	Anon. $4^h 18^m 49^s$.	7.7	3	III–VII	41 45 3.2	4.5	7.8	5.4	10.1	7.3	6.38	34.370	. .	33.723
	31	Anon. $4^h 34^m 18^s$ . .	8.2	2	III, V	20 45 0.1	0.9	3.8	59.7	6.3	1.1	1.98	31.046	. .	30.396
	32	Anon. $4^h 34^m 34^s$.	7.2	2	VII, IX	“ “ “	“	“	“	“	“	“	36.386	. .	35.717
	33	O. Arg. S. 3576 . .	8.0	3	III, VII	88 35 7.4	9.1	10.7	7.2	13.4	9.7	9.58	27.490	. .	26.850
	34	Nadir	. .	.	. .	199 59 53.2	56.6	59.1	56.3	59.2	58.0	57.07	30.403	30.644	. .
Feb. 1	35	64 Andromedæ . . .	. .	3	III–VII	9 25 3.3	5.2	7.0	4.0	11.1	5.8	6.07	27.775	30.746	27.018
	36	Anon. $2^h 29^m 20^s$.	5.0	3	III–VII	39 35 3.8	3.7	5.6	3.1	9.8	6.8	5.47	31.666	. .	30.917
	37	B. A. C. 840 . . .	. .	3	III–VII	97 45 5.8	5.8	8.1	5.0	11.6	9.2	7.58	32.755	. .	32.037
	38	Anon. $2^h 59^m 44^s$.	. .	3	III–VII	8 10 1.9	1.4	4.8	0.6	7.9	4.1	3.45	27.030	. .	26.272
	39	B. A. C. 1005 . . .	. .	3	III–VII	89 5 1.5	1.9	3.1	0.2	6.4	4.8	2.98	26.780	. .	26.040
	40	65 Arietis	. .	3	III–VII	38.30 0.0	59.7	3.4	58.5	7.7	3.3	2.10	28.526	. .	27.776
	41	Anon. $3^h 27^m 16^s$.	7.5	3	III–VII	27 15 3.3	5.8	6.4	3.8	11.1	8.2	6.43	27.078	. .	26.326
	42	Anon. $3^h 28^m 48^s$.	8.5	3	V–IX	“ “ “	“	“	“	“	“	“	28.689	. .	27.930
	43	Weisse (2) III, 776 .	8.0	3	III, VII, IX	13 55 3.9	6.2	6.8	1.9	10.7	7.9	6.23	29.952	. .	29.188
	44	Weisse (2) III, 847 .	8.0	3	V–IX	“ “ “	“	“	“	“	“	“	30.704	. .	29.937
	45	Anon. $3^h 49^m 37^s$.	9.2	3	V–IX	23 15 1.2	0.8	3.2	58.4	8.4	4.6	2.77	28.414	. .	27.653
	46	Weisse (2) III, 1251 .	8.0	3	III–VII	17 45 2.1	3.2	6.9	0.9	9.6	5.4	4.68	33.121	. .	32.367
	47	Weisse (2) III, 1269 .	7.0	2	VII, IX	“ “ “	“	“	“	“	“	“	34.910	. .	34 136
	48	Weisse (2) IV, 130 .	. .	3	III–VII	38 25 6.4	6.2	9.2	5.0	13.3	11.6	8.62	35.771	. .	35.021
	49	Anon. $4^h 18^m 49^s$.	7.5	3	III–VII	41 45 2.2	4.7	5.1	1.9	10.8	8.2	5.48	34.371	. .	33.622
	50	Weisse (2) IV, 506 .	9.0	3	V–IX	23 20 3.6	4.4	6.2	2.2	11.2	8.0	5.93	32.466	. .	31.705
	51	Anon. $4^h 35^m 34^s$.	. .	3	IV–VI	84 50 5.6	5.3	8.5	5.6	11.8	9.9	7.78	26.128	. .	25.383
	52	Lacaille 1615. . .	7.0	3	III–VII	84 25 1.2	2.4	5.3	2.8	9.2	6.7	4.60	34.917	. .	34.176
	53	Anon. $4^h 52^m 29^s$.	. .	1	V	358 34 57.5	57.4	62.3	57.2	64.2	60.4	59.83	22.538	. .	21.792
	54	Nadir	. .	.	. .	199 59 59.3	58.5	61.9	59.3	64.0	64.5	61.25	30.635	30.746	. .
3	55	ι Persei	. .	3	III–VII	9 45 3.8	4.2	7.6	5.0	10.2	5.1	5.98	31.006	30.725	30.270
	56	B. A. C. 1005 . . .	. .	3	III–VII	89 5 4.9	6.2	8.2	6.0	8.7	7.0	6.83	27.016	. .	26.297
	57	Anon. $3^h 27^m 16^s$.	7.5	3	I–V	27 15 0.7	2.6	5.7	2.1	6.7	4.0	3.63	26.952	. .	26.214
	58	Anon. $3^h 28^m 48^s$.	8.5	3	III–VII	“ “ “	“	“	“	“	“	“	28.540	. .	27.809
	59	Weisse (2) III, 776 .	8.0	3	III–VII	13 55 1.8	3.8	5.9	2.1	7.0	3.5	4.02	29.862	. .	29.127
	60	Weisse (2) III, 847 .	8.0	3	III–VII	“ “ “	“	“	“	“	“	“	30.672	30.925	29.937
	61	Weisse (2) III, 1030 .	8.2	2	V, VII	23 15 6.1	8.2	10.9	8.2	12.7	8.3	9.07	31.530	. .	30.800
	62	Anon. $3^h 49^m 37^s$.	8.7	3	V–IX	“ “ “	“	“	“	“	“	“	28.668	. .	27.928
	63	Weisse (2) III, 1251 .	8.0	3	III–VII	17 45 0.3	1.2	5.7	1.0	5.3	1.8	2.55	33.062	. .	32.329
	64	Weisse (2) III, 1269 .	7.0	2	VII, IX	“ “ “	“	“	“	“	“	“	34.771	. .	34.018
	65	Weisse (2) IV, 130 .	8.3	3	III–VII	38 25 1.9	2.8	7.8	3.9	8.3	5.2	4.98	35.678	30.725	34.949

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	' "	° ' "	' "	° ' "	"		
30.192	39.0	36.0	+ 0 3.8	N. 49 44 48.9	+1 11.2	+ 88 39 38.9	− 25.4	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.188	39.1	35.4	− 2 42.4	S. 73 17 24.1	3 18.9	34 27 4.2	+ 7.0	Y.	
30.188	39.1	35.0	− 1 46.0	24 33 20.0	27.6	14 19 51.2	− 8.6	Y.	
. .	. .	34.7	+ 1 32.1	80 41 39.0	5 55.5	+ 41 53 55.7	+ 8.1	Y.	
. .	. .	. .	− 2 13.2	0 22 49.9	0.4	+ 38 30 48.5	− 17.3	Y.	
30.180	39.0	33.4	− 2 1.8	S. 0 23 1.4	0.4	38 30 37.0	17.3	Y.	
. .	. .	. .	+ 1 30.7	N. 10 33 21.4	11.1	+ 49 27 11.3	− 19.8	Y.	
30.176	46.0	42.2	− 2 38.4	S. 73 12 21.2	3 14.9	− 34 21 57.3	+ 7.1	Y.	
. .	. .	. .	− 1 29.3	S. 24 33 22.9	27.2	+ 14 19 48.7	− 8.3	Y.	
30.176	46.0	43.0	+ 1 54.7	N. 11 48 0.8	12.4	+ 50 41 51.4	− 20.8	Y.	
30.180	45.6	41.8	− 3 4.5	S. 69 7 1.3	2 35.1	− 30 15 57.6	+ 5.3	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.424	46.6	46.0	+ 1 41.6	S. 30 36 49.2	35.3	+ 8 16 14.3	− 5.6	Y.	
. .	. .	45.9	+ 1 32.5	N. 10 33 21.1	11.1	+ 49 27 11.0	− 19.7	Y.	
30.426	46.9	44.2	− 2 45.6	S. 73 12 18.0	3 15.7	− 34 21 54.9	+ 7.1	Y.	
. .	. .	. .	− 1 46.1	24 33 22.9	27.4	+ 14 19 48.5	− 8.3	Y.	
30.430	46.6	42.0	+ 1 37.3	S. 80 41 39.8	5 52.9	− 41 53 53.9	+ 8.3	Y.	
. .	. .	. .	+ 1 53.7	N. 11 48 0.0	12.5	+ 50 41 51.3	− 20.8	Y.	
. .	. .	42.8	− 1 8.1	77 43 50.8	4 29.5	− 38 54 41.5	+ 7.7	Y.	
. .	. .	41.8	+ 1 50.4	69 6 59.3	2 36.3	30 15 56.8	5.2	Y.	
. .	. .	. .	− 1 2.5	60 14 0.1	1 44.8	− 21 22 6.1	+ 2.6	Y.	
. .	. .	. .	+ 0 34.8	7 25 40.9	7.8	+ 31 27 50.1	− 14.8	Y.	
30.436	46.0	41.0	+ 2 5.8	S. 7 27 11.9	7.8	31 26 19.1	14.8	Y.	
. .	. .	. .	+ 0 28.7	N. 6 4 27.2	6.4	44 58 12.4	19.1	Y.	
. .	. .	. .	+ 3.1	N. 6 4 52.8	6.4	44 58 38.0	19.0	Y	
. .	. .	. .	+ 57.7	S. 3 50 59.6	4.1	35 2 35.1	15.8	Y.	
. .	. .	. .	+ 13.8	3 50 15.7	4.0	35 3 19.1	15.8	Y.	
30.428	45.0	39.4	− 2 27.0	21 22 39.1	23.7	17 30 36.0	9.9	Y.	
. .	. .	. .	1 56.7	21 43 9.7	24.1	17 10 5.0	9.7	Y.	
. .	. .	. .	12.4	0 44 49.6	0.8	38 8 48.4	15.9	Y.	
. .	. .	. .	− 2 59.2	0 42 2.8	0.7	+ 38 11 35.3	− 15.9	Y.	
30.434	43.8	38.7	+ 1 38.7	S. 68 36 48.3	2 33.4	− 29 45 42.9	+ 3.3	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.034	53.0	55.0	+ 1 33.4	N. 10 33 20.5	10.8	+ 49 27 10.1	− 19.6	Y.	
. .	. .	. .	− 28.7	S. 19 34 36.7	20.6	+ 19 18 41.5	− 9.9	Y.	
30.036	53.2	53.6	− 1 3.8	S. 77 44 3.7	4 20.2	− 38 54 45.1	+ 7.8	Y.	
. .	. .	. .	+ 1 56.8	N. 11 47 59.7	12.1	+ 50 41 50.6	− 20.8	Y.	
30.032	53.0	51.1	2 4.1	S. 69 7 7.1	2 31.4	− 30 15 59.7	+ 5.4	Y.	
. .	. .	. .	1 9.7	18 31 11.8	19.5	+ 20 22 7.5	− 10.9	Y.	
. .	. .	. .	1 55.1	7 17 1.6	7.4	31 36 29.8	14.8	Y.	
. .	. .	. .	1 4.9	S. 7 16 11.3	7.4	31 37 20.1	14.8	Y.	
. .	. .	. .	25.4	N. 6 4 28.4	6.2	44 58 13.4	19.1	Y.	
. .	. .	. .	2.0	N. 6 4 51.8	6.2	44 58 36.8	19.1	Y.	
30.034	53.0	51.2	+ 1 13.6	S. 3 16 16.3	3.3	35 37 19.2	16.0	Y.	
. .	. .	. .	− 1 14.2	N. 2 16 9.5	2.3	41 9 50.6	17.7	Y.	
. .	. .	. .	2 9.6	N. 2 17 4.9	2.3	41 10 46.0	17.7	Y.	
. .	. .	. .	2 37.4	S. 18 22 31.2	19.4	20 30 48.2	10.8	Y.	
. .	. .	. .	1 53.5	21 43 12.0	23.2	17 10 3.6	9.6	Y.	
. .	. .	. .	− 53.4	3 19 12.5	3.4	+ 35 34 22.9	− 15.5	Y.	
30.036	52.5	50.0	+ 2 24.7	64 52 32.5	3.8	− 26 0 57.5	+ 3.0	Y.	
. .	. .	. .	− 2 10.9	S. 64 22 53.7	2 1.5	− 25 31 16.4	+ 2.8	Y.	
30.034	52.2	48.1	+ 4 17.2	N. 21 20 43.0	22.9	+ 60 14 44.7	− 21.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	− 8.5	N. 10 15 2.5	10.6	+ 49 8 51.9	− 20.4	Y.	
30.194	51.7	48.1	+ 1 56.1	S. 69 7 2.9	2 33.1	− 30 15 57.2	+ 5.4	Y.	
. .	. .	. .	1 58.7	7 17 2.3	7.5	+ 31 36 29.0	− 14.9	Y.	
. .	. .	. .	1 8.7	S. 7 16 12.3	7.5	31 37 19.0	14.9	Y.	
. .	. .	. .	27.3	N. 6 4 28.6	6.3	44 58 13.7	19.2	Y.	
30.195	51.0	46.9	+ 2.0	N. 6 4 54.0	6.3	44 58 39.1	19.2	Y.	
. .	. .	. .	− 25.1	3 14 44.0	3.3	35 38 51.5	16.1	Y.	
. .	. .	. .	+ 1 4.9	3 16 14.0	3.4	35 37 21.4	15.9	Y.	
. .	. .	. .	− 1 13.0	2 16 10.5	2.3	41 9 51.6	17.8	Y.	
. .	. .	. .	2 5.9	2 17 3.4	2.4	41 10 44.6	17.8	Y.	
30.210	50.5	45.7	− 2 35.1	N. 18 22 29.9	+ 19.6	+ 20 30 49.3	− 10.9	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. Feb. 3	1	Anon. $4^h 18^m 49^s$	7.2	3	III-VII	41 45 3.3	4.1	7.9	5.2	9.1	7.3	6.15	34.429	30.725	33.701
	2	Weisse (2) 506	9.0	3	III-VII	23 20 2.3	4.1	6.8	4.9	8.2	4.7	5.17	32.400	. .	31.668
	3	Anon. $4^h 35^m 38^s$	. .	3	III-VII	84 50 4.5	6.5	10.9	9.8	10.8	8.5	8.55	26.437	. .	25.717
	4	Anon. $4^h 42^m$	8.5	2	II, IV	48 10 2.1	1.2	5.8	4.1	8.1	6.1	4.57	30.181	. .	29.453
	5	Anon. $4^h 43^m$	9.0	2	VII, IX	" " "	"	"	"	"	"	"	31.130	. .	30.399
	6	Anon. $4^h 52^m 24^s$	7.7	3	IV-VI	358 40 4.7	6.8	11.8	8.9	11.8	7.2	8.53	32.396	. .	31.667
	7	15 Orionis	5.0	3	III-VII	43 25 3.2	5.6	7.9	6.9	9.4	6.9	6.65	27.543	. .	26.815
	8	Lacaille 1770	6.8	3	III-VII	87 20 3.7	5.5	8.0	7.8	9.1	7.1	6.87	31.122	. .	30.402
	9	Anon. $5^h 17^m 16^s$	7.7	3	III-VII	21 0 2.8	4.5	7.[illegible]	7.5	9.1	6.2	6.20	35.646	. .	34.914
	10	Anon. $5^h 23^m 18^s$	6.8	3	III-VII	91 25 0.2	4.3	5.9	4.0	6.7	4.1	4.20	36.693	. .	35.974
	11	Anon. $5^h 35^m 52^s$	. .	2	VII, IX	20 45 2.0	5.2	7.9	4.9	8.9	5.1	5.67	38.900	. .	38.150
	12	Anon. $5^h 36^m 37^s$	. .	2	III, V	" " "	"	"	"	"	"	"	36.706	. .	35.975
	13	Anon. $5^h 39^m 10^s$	. .	3	IV-VI	" " "	"	"	"	"	"	"	28.903	. .	28.176
	14	Nadir	. .	.	. .	199 59 59.4	1.2	3.8	3.1	4.1	4.0	2.60	30.658	30.725	. .
6	15	ε Arietis	. .	3	III-VII	38 5 0.7	1.8	5.4	4.3	5.9	4.9	3.83	35.873	30.713	35.156
	16	ι Persei	. .	3	III-VII	9 45 2.7	5.1	7.2	6.8	8.8	6.1	6.12	30.975	. .	30.251
	17	Anon. $3^h 19^m 10^s$	8.0	2	I, IX	359 24 57.7	58.7	63.7	60.1	63.4	59.2	60.47	30.505	. .	29.692
	18	B. A. C. 1058	. .	3	IV-VI	" " "	"	"	"	"	"	"	34.452	. .	33.734
	19	Anon. $3^h 34^m 40^s$	7.0	3	V-IX	87 14 57.5	60.3	61.0	61.4	62.7	60.7	60.60	36.149	. .	35.447
	20	Lacaille 1177	7.5	3	V-IX	" " "	"	"	"	"	"	"	33.895	. .	33.193
	21	Groombridge 745	8.5	3	V, VI, VII	343 4 58.0	58.8	62.7	. .	62.8	60.2	60.55	31.056	. .	30.318
	22	Weisse (2) 1143	. .	3	III-VII	23 49 56.7	59.9	62.1	59.9	62.5	59.9	60.17	30.591	. .	29.871
	23	Anon. $4^h 11^m 34^s$	. .	3	III-VII	41 25 0.0	3.2	4.7	4.7	6.6	4.0	3.87	35.322	. .	34.606
	24	Lacaille 1451	6.0	3	III-VII	83 15 0.1	3.4	4.9	5.2	6.0	4.1	3.95	34.157	. .	33.448
	25	Anon. $4^h 34^m 34^s$	7.0	3	III-VII	20 40 0.2	3.2	5.8	3.8	6.4	3.8	3.87	26.959	. .	26.238
	26	Anon. $4^h 42^m$	. .	2	III, VII	48 10 4.7	6.8	8.9	8.8	11.2	7.9	8.05	29.092	. .	28.377
	27	Anon. $4^h 52^m 24^s$	7.7	3	IV-VI	358 40 4.2	8.2	11.7	9.5	11.3	7.2	8.68	32.426	. .	31.708
	28	Anon. $4^h 59^m 2^s$	8.2	3	III-VII	86 40 2.7	5.8	9.2	9.2	9.2	7.0	7.18	28.349	. .	27.641
	29	Lacaille 1754	6.5	3	III-VII	96 25 2.8	6.3	9.1	8.2	9.9	5.8	7.02	35.805	. .	35.099
	30	Anon. $5^h 17^m 17^s$	7.7	2	III, VII	20 59 59.1	61.2	64.1	64.1	65.2	61.9	62.60	35.542	. .	34.818
	31	O. Arg. S. 4060	6.5	3	III-VII	84 20 3.5	7.1	9.8	8.2	10.2	6.2	7.50	33.015	. .	32.307
	32	Anon. $5^h 36^m 43^s$	8.3	2	V-VII	27 40 7.1	11.2	12.8	11.0	12.8	11.0	10.98	34.213	. .	33.496
	33	Anon. $5^h 50^m 5^s$	. .	3	III-VII	51 40 5.4	8.4	10.4	10.0	11.7	9.8	9.28	32.437	. .	31.723
	34	Nadir	. .	.	. .	199 59 57.7	62.7	63.0	65.4	63.1	63.0	62.48	30.643	30.713	. .
May 23	35	Anon. $12^h 8^m 44^s$	7.0	3	IV-VI	87 25 1.3	59.3	5.0	3.9	0.2	3.3	2.17	30.910	30.695	30.217
	36	Radcliffe 2860	7.2	3	IV-VI	354 25 4.1	2.0	9.8	5.4	2.8	7.2	5.22	30.886	. .	30.185
	37	O. Arg. S. 12243	. .	1	V	81 45 1.7	1.8	6.0	4.9	0.1	4.9	3.23	36.191	. .	35.496
	38	Anon. $12^h 41^m 21^s$	. .	3	III-VII	85 45 1.2	1.4	6.8	6.4	1.8	4.9	3.92	30.124	. .	29.434
	39	O. Arg. S. 12567	8.0	1	V	80 20 1.4	59.7	5.7	4.7	59.7	4.1	2.55	30.561	. .	29.866
	40	Anon. $13^h 3^m 45^s$	8.3	3	III-VII	81 50 0.7	58.9	3.9	3.9	57.1	2.9	1.23	30.048	. .	29.357
	41	Anon. $13^h 14^m 27^s$	9.0	2	III, VII	46 0 2.7	2.1	7.0	6.0	2.7	5.1	4.27	31.406	. .	30.708
	42	Weisse XIII, 626	8.0	3	III-VII	71 5 2.3	2.2	6.8	6.8	1.2	6.2	4.25	30.345	. .	29.652
	43	Anon. $13^h 46^m 10^s$	8.0	3	III-VII	97 14 55.7	56.2	61.7	59.9	54.2	57.4	57.52	26.973	. .	26.286
	44	Anon. $13^h 57^m 21^s$	8.0	3	III-VII	92 0 0.1	0.2	5.7	4.1	56.7	1.3	1.35	26.583	. .	25.894
	45	Anon. $13^h 58^m 31^s$	9.0	2	VII, IX	92 0 0.1	"	"	"	"	"	"	35.320	. .	34.645
	46	Anon. $14^h 29^m 56^s$	8.8	1	V	86 35 1.6	2.2	8.1	8.8	0.3	4.9	4.32	32.511	. .	31.816
	47	Nadir	. .	.	. .	199 59 59.0	60.1	64.2	65.4	57.5	63.0	61.53	30.596	30.695	. .
29	48	Anon. $12^h 8^m 54^s$	7.0	3	III-VII	87 24 60.0	55.1	59.0	58.2	57.8	63.9	59.00	30.719	30.664	30.060
	49	Anon. $12^h 16^m 31^s$	5.5	3	V-IX	32 20 4.3	1.7	3.2	1.1	5.2	7.9	3.90	27.333	. .	26.659
	50	Weisse (2) XII, 348	7.5	3	V-IX	" " "	"	"	"	"	"	"	27.811	. .	27.137
	51	O. Arg. S. 12246	7.7	3	III-VII	81 44 60.4	58.1	61.1	57.2	58.8	64.1	59.95	31.867	. .	31.207
	52	Anon. $12^h 41^m 21^s$	8.0	3	III-VII	85 45 3.0	58.9	3.8	1.5	2.2	6.4	2.63	29.994	. .	29.335
	53	Lacaille 5311	6.0	3	V-IX	97 30 5.2	3.9	7.0	4.9	5.8	9.8	6.25	24.756	. .	24.109
	54	Anon. $13^h 24^m 33^s$	9.5	2	III, VII	93 30 3.0	2.1	4.2	2.3	3.5	8.3	3.80	30.031	. .	29.376
	55	B. A. C. 4560	7.7	3	V-IX	71 5 7.0	5.3	8.0	6.0	7.4	13.0	7.78	36.052	. .	35.393
	56	Weisse XIII, 731	. .	3	III-VII	71 25 2.7	1.7	4.0	2.4	3.1	9.4	3.88	35.219	. .	34.560
	57	Anon. $13^h 57^m 23^s$	8.0	2	VII, IX	92 0 2.7	1.4	4.8	1.9	2.1	6.1	3.17	26.635	. .	25.991
	58	Anon. $13^h 58^m 31^s$	9.0	1	IX	" " "	"	"	"	"	"	"	35.596	. .	34.964
	59	O. Arg. N. 14432	8.5	1	V	7 0 2.0	0.3	4.8	0.1	2.2	6.1	2.58	35.864	. .	35.200
	60	Anon. $14^h 29^m 56^s$	9.2	1	V	86 35 3.1	2.8	6.2	5.1	2.8	8.1	4.68	32.628	. .	31.964
	61	Lacaille 6109	7.0	2	VII, IX	90 45 5.7	4.3	9.0	4.2	6.1	9.8	6.52	28.825	. .	28.181
	62	Nadir	. .	.	. .	200 0 2.9	0.3	4.1	2.0	0.8	8.9	3.17	30.616	30.664	. .
June 2	63	Lacaille 6109	7.5	3	III-VII	90 45 2.9	58.3	4.7	0.0	0.2	6.1	2.03	28.539	30.696	27.849
	64	ι^2 Libræ	. .	3	III-VII	78 5 6.1	3.9	7.8	4.1	5.8	10.4	6.35	33.846	. .	33.153
	65	Radcliffe 3487	. .	2	IV, VI	14 25 5.0	3.1	6.9	2.9	5.7	8.9	5.42	25.613	30.696	24.913

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 1 56.0	S. 21 43 10.2	23.6	+ 17 10 5.0	− 9.6	Y.	
2	. .	. .	. .	− 52.3	3 19 12.9	3.4	+ 35 34 22.5	− 15.5	Y.	
3	. .	. .	. .	+ 2 14.2	64 52 22.8	2 5.8	− 26 0 49.8	+ 3.2	Y.	
4	. .	. .	. .	+ 17.1	28 10 21.7	31.8	+ 10 42 45.3	− 7.3	Y.	
5	. .	. .	. .	− 12.5	S. 28 9 52.1	31.8	10 43 14.9	7.2	Y.	
6	30.210	49.5	44.1	− 52.2	N. 21 20 43.7	23.2	60 14 45.7	21.3	Y.	
7	. .	. .	. .	+ 1 39.8	S. 23 26 46.5	25.8	+ 15 26 26.5	− 8.3	Y.	
8	. .	. .	. .	− 12.6	67 19 54.3	2 21.5	− 28 28 37.0	+ 3.3	Y.	
9	. .	. .	. .	2 34.0	0 57 32.2	1.0	+ 37 56 5.6	− 14.5	Y.	
10	30.218	48.8	42.8	3 7.2	71 21 57.0	2 54.9	− 32 31 13.1	+ 3.9	Y.	
11	. .	. .	. .	4 15.4	0 40 50.3	0.7	+ 38 12 47.8	− 13.7	Y.	
12	. .	. .	. .	− 3 7.2	0 41 58.4	0.7	38 11 39.7	13.7	Y.	
13	30.220	48.5	37.0	+ 57.1	0 46 2.8	0.8	38 7 35.2	13.5	Y.	
14	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
15	30.024	49.0	44.6	− 2 41.6	S. 18 2 22.2	19.2	20 50 57.4	10.7	Y.	
16	. .	. .	. .	− 7.9	N. 10 15 1.8	10.7	49 8 51.3	20.4	Y.	
17	. .	. .	. .	+ 9.7	20 34 49.9	22.2	59 28 50.9	23.5	Y.	
18	. .	. .	. .	− 1 57.0	N. 20 36 56.6	22.2	+ 59 30 57.6	− 23.5	Y.	
19	. .	. .	. .	2 50.7	S. 67 12 9.9	2 20.0	− 28 20 51.4	+ 4.6	Y.	
20	30.024	48.8	42.4	1 40.1	S. 67 13 20.5	2 20.1	− 28 22 1.8	+ 4.6	Y.	
21	. .	. .	. .	− 10.0	N. 36 55 9.4	44.5	+ 75 49 32.7	− 27.1	Y.	
22	. .	. .	. .	+ 4.0	S. 3 50 4.2	4.0	35 3 30.6	15.9	Y.	
23	30.020	47.8	40.9	− 2 24.3	21 22 39.5	23.3	+ 17 30 36.0	− 9.8	Y.	
24	30.020	47.2	40.6	− 1 48.1	63 13 15.9	1 57.3	− 24 21 34.4	+ 3.1	Y.	
25	. .	. .	. .	+ 1 57.9	0 42 1.8	0.7	+ 38 11 36.3	− 16.3	Y.	
26	. .	. .	. .	+ 50.9	S. 28 10 58.9	31.9	10 42 8.0	7.2	Y.	
27	. .	. .	. .	− 53.5	N. 21 20 44.9	23.3	+ 60 14 47.0	− 21.9	Y.	
28	30.012	46.5	39.4	+ 1 13.9	S. 66 41 21.1	+ 2 17.4	− 27 45 59.7	+ 3.6	Y.	
29	. .	. .	. .	− 2 39.8	76 22 27.2	4 1.2	− 37 32 49.6	5.3	Y.	
30	. .	. .	. .	2 31.0	0 57 31.6	1.0	+ 37 56 6.2	14.6	Y.	
31	. .	. .	. .	1 12.3	64 18 55.2	2 3.3	− 25 27 19.7	+ 2.9	Y.	
32	. .	. .	. .	1 49.6	7 38 21.4	8.0	+ 31 15 9.4	− 11.7	Y.	
33	30.000	45.5	39.2	54.0	31 39 15.3	36.7	+ 7 13 46.8	− 4.7	Y.	
34	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
35	29.826	70.2	63.2	6.8	S. 67 24 55.4	2 14.6	− 28 33 31.2	+ 22.4	Y.	
36	. .	. .	63.0	5.8	N. 25 35 0.6	27.0	+ 64 29 6.4	− 3.3	Y.	
37	. .	. .	. .	− 2 52.2	S. 61 42 11.0	1 44.4	− 22 50 16.6	+ 21.2	Y.	
38	29.820	70.0	62.0	+ 17.7	65 45 21.7	2 4.7	26 53 47.6	22.3	Y.	
39	. .	. .	. .	4.2	60 20 6.7	1 38.9	21 28 6.8	21.1	Y.	
40	29.824	69.0	61.2	+ 20.1	61 50 21.4	1 45.3	− 22 58 27.9	21.4	Y.	
41	. .	. .	. .	− 22.2	25 59 42.1	27.6	+ 12 53 29.1	12.7	Y.	
42	29.826	68.0	60.3	+ 10.9	51 5 15.2	1 10.1	− 12 12 46.5	19.0	Y.	
43	. .	. .	60.2	1 56.4	77 16 53.9	4 5.7	38 27 20.8	23.4	Y.	
44	. .	. .	. .	+ 2 8.7	72 2 10.0	2 53.3	33 11 24.5	22.4	Y.	
45	. .	. .	. .	− 2 25.6	71 57 35.8	2 52.6	33 6 49.3	22.4	Y.	
46	29.840	66.2	58.2	56.9	66 34 7.4	2 10.6	27 42 39.2	20.6	Y.	
47	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
48	30.200	71.0	70.3	− 1.9	67 24 57.1	2 14.4	− 28 33 33.3	22.5	Y.	
49	. .	. .	. .	+ 1 44.7	12 21 48.6	12.3	+ 26 31 37.9	5.5	Y.	
50	. .	. .	. .	+ 1 29.7	12 21 33.6	12.3	+ 26 31 52.9	5.6	Y.	
51	30.198	71.0	70.2	− 37.8	61 44 22.1	1 44.3	− 22 52 27.6	21.2	Y.	
52	. .	. .	. .	+ 20.8	65 45 23.5	2 4.5	26 53 49.2	22.4	Y.	
53	30.196	71.0	69.3	3 4.6	77 33 10.9	4 9.5	38 43 41.6	25.1	Y.	
54	30.192	70.0	66.2	+ 19.6	73 30 23.5	3 9.1	34 39 53.8	23.9	Y.	
55	. .	. .	. .	− 2 49.0	51 2 18.8	1 10.1	12 9 50.1	18.9	Y.	
56	30.180	69.5	65.0	− 2 22.9	51 22 41.0	1 11.0	12 30 13.2	19.0	Y.	
57	. .	. .	. .	+ 2 5.6	72 2 8.8	2 53.5	33 11 23.5	23.9	Y.	
58	. .	. .	. .	− 2 35.6	S. 71 57 27.6	2 52.8	− 33 6 41.6	22.8	Y.	
59	30.180	69.0	63.9	2 43.0	N. 13 2 40.4	13.2	+ 51 56 32.4	5.5	Y.	
60	. .	. .	. .	− 1 1.6	S. 66 34 3.1	2 10.7	− 27 42 35.0	21.0	Y.	
61	30.170	68.0	63.4	+ 57.0	70 46 3.5	2 41.9	31 55 6.6	21.1	Y.	
62	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
63	30.062	75.5	73.4	+ 1 7.4	70 46 9.4	2 38.1	31 55 8.7	21.4	Y.	
64	. .	. .	. .	− 1 38.8	S. 58 3 27.5	1 29.2	− 19 11 17.9	18.6	Y.	
65	30.050	75.0	72.5	+ 2 39.4	N. 5 32 15.1	5.4	+ 44 25 59.3	+ 9.1	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. June 2	1	40 Libræ	6.0	2	VII, IX	88 15 5.2	2.7	6.2	1.5	3.8	9.3	4.78	32.866	30.696	32.188
	2	O. Arg. S. 15615 . .	8.5	3	III–VII	82 0 3.1	3.8	3.9	1.5	1.1	7.5	3.48	25.649	. .	24.957
	3	Nadir	. .	.	. .	200 0 2.9	1.2	4.9	1.5	1.3	7.7	3.25	30.649	30.696	. .
25	4	Lacaille 5872. . .	. .	3	III–VII	91 30 2.5	55.8	1.2	57.0	0.5	6.4	0.57	27.899	30.648	27.257
	5	B. A. C. 4769 . . .	5.5	3	III–VII	52 30 5.1	1.4	5.8	1.6	6.2	11.8	5.32	29.808	. .	29.159
	6	Lacaille 5988 . .	7.0	2	III, VII	90 15 5.2	3.2	5 8	2.4	5.8	10.2	5.43	28.210	. .	27.553
	7	π^1 Bootis.	. .	2	I, IX	41 54 58.7	57.1	59.7	53.1	61.5	65.1	59.20	27.487	. .	26.824
	8	π^2 Bootis.	. .	2	V, VII	" " "	"	"	"	"	"	"	27.418	. .	26.768
	9	B. A. C. 4912 . . .	5.5	3	III–VII	92 30 3.2	0.2	2.9	0.8	3.1	7.3	2.92	31.775	. .	31.133
	10	Anon. 14^h 54^m 31^s .	8.2	2	VII, IX	15 0 7.1	4.3	8.9	0.2	8.5	11.9	6.82	31.774	. .	31.096
	11	Anon. 15^h 5^m 5^s . .	9.2	3	III–VII	84 0 5.1	1.9	5.9	3.4	5.4	10.2	5.32	28.691	. .	28.048
	12	ϕ^2 Lupi	5.0	3	III–VII	95 15 1.7	58.2	3.2	58.8	2.3	7.0	1.87	29.653	. .	29.012
	13	Lacaille 6410. . .	7.5	3	III–VII	96 30 6.0	2.7	7.7	4.0	6.5	11.0	6.32	32.236	. .	31.595
	14	Lacaille 6495. . .	7.0	3	III–VII	89 0 0.0	56.6	0.5	57.3	0.2	5.6	0.03	30.502	. .	29.860
	15	A Scorpii	4.5	3	III–VII	83 50 2.3	58.1	1.7	57.1	2.0	6.5	1.28	31.517	. .	30.873
	16	Nadir	. .	.	. .	200 0 4.3	58.1	3.9	0.0	2.7	11.2	3.37	30.607	. .	. .
	17	Weisse (2) XVI, 787.	. .	3	III–VII	20 35 3.3	59.2	4 9	59.0	6.0	8.1	3.42	32.635	. .	31.979
	18	B. A. C. 5008 . . .	7.0	3	III–VII	85 15 6.7	2.7	8.6	6.0	9.1	11.8	7.48	26.893	. .	26.250
	19	Lalande 30745 . .	. .	3	III–VII	20 45 5.4	2.4	7.8	1.8	8.9	11.2	6.25	32.506	. .	31.850
	20	31 Ophiuchi	. .	3	V–IX	84 19 54.2	50.7	56.0	50.0	54.2	59.1	54.03	30.351	30.648	29.713
28	21	π^1 Bootis.	. .	1	IX	41 55 0.8	0.4	4.3	1.9	1.6	5.3	2.38	27.676	30.691	26.970
	22	π^2 Bootis.	. .	1	VIII	" " "	"	"	"	"	"	"	27.632	. .	26.933
	23	B. A. C. 4912 . . .	. .	3	III–VII	92 30 2.2	0.1	5.0	4.6	59.8	4.2	2.65	32.023	. .	31.338
	24	Weisse (2) 1154 . .	. .	2	III, VII	15 0 3.6	3.2	8.0	6.0	4.7	7.3	5.47	32.068	. .	31.363
	25	O. Arg. S. 14490 . .	8.5	3	III–VII	88 50 2.1	1.0	4.9	3.9	1.2	5.9	3.17	35.171	. .	34.486
	26	Radcliffe 3387 . .	. .	3	III–VII	14 30 2.1	3.8	7.2	6.0	2.8	6.2	4.68	35.438	. .	34.738
	27	Lalande 28740 . .	7.5	3	IV–VI	352 45 7.9	8.8	14.7	11.8	8.3	12.3	10.63	35.444	. .	34.751
	28	A Scorpii	5.0	3	V–IX	83 50 0.8	0.0	3.9	2.8	0.0	4.0	1.92	31.668	. .	30.987
	29	Nadir	. .	.	. .	199 59 57.8	57.2	62.0	61.0	56.3	62.9	59.53	30.527	. .	. .
	30	O. Arg. S. 15621 . .	8.2	3	IV–VI	81 59 58.1	56.8	60.8	58.0	55.3	59.4	58.07	31.921	. .	31.231
	31	Anon. 16^h 30^m 49^s .	9.0	3	III–VII	87 30 3.8	3.1	6.3	5.9	3.3	5.8	4.70	26.581	. .	25.895
	32	O. Arg. S. 15790 . .	8.0	2	VII, IX	" " "	"	"	"	"	"	"	28.961	. .	28.287
	33	O. Arg. S. 16090 . .	. .	3	V–IX	87 59 58.1	59.7	62.9	61.8	57.8	62.0	0.38	25.973	. .	25.294
	34	Anon. 16^h 56^m 33^s .	8.0	3	V–IX	79 10 5.2	6.8	10.7	6.9	6.3	8.9	7.47	30.785	. .	30.102
	35	Anon. 17^h 9^m 19^s .	. .	2	III–VII	94 15 3.0	2.8	7.9	5.9	3.7	6.3	4.93	30.597	. .	29.916
	36	Anon. 17^h 9^m 26^s .	. .	1	V	" " "	"	"	"	"	"	"	31.952	30.691	31.261
29	37	Lacaille 5963 . .	. .	3	III–VII	97 10 4.8	4.6	9.5	4.0	5.7	9.3	6.32	31.987	30.662	31.333
	38	π^1 Bootis	. .	2	I, IX	41 55 3.2	3.9	7.1	3.8	6.1	9.9	5.67	27.766	. .	27.089
	39	π^2 Bootis	. .	3	III–VII	" " "	"	"	"	"	"	"	27.703	. .	27.038
	40	Lacaille 6109 . .	7.0	3	III–VII	90 45 3.2	2.2	5.6	2.2	3.8	7.1	4.02	28.529	. .	27.873
	41	Anon. 14^h 43^m 16^s .	7.5	2	VII, IX	" " "	"	"	"	"	"	"	24.273	. .	23.631
	42	ψ Bootis.	5.0	3	III–VII	31 25 5.8	4.2	8.0	4.9	8.2	10.4	6.92	25.387	. .	24.720
	43	B. A. C. 5006 . . .	6.5	3	III–VII	84 35 1.7	1.2	6.1	3.0	3.7	6.0	3.65	29.044	. .	28.387
	44	Anon. 15^h 17^m 4^s .	9.0	2	III, V	99 55 5.1	5.9	10.0	6.8	7.8	10.2	7.63	32.546	. .	31.889
	45	Anon. 15^h 18^m 1^s .	8.5	3	V–IX	" " "	"	"	"	"	"	"	34.333	. .	33.687
	46	Lalande 28740 . .	7.2	3	IV–VI	352 45 7.1	7.2	13.2	8.0	9.7	11.8	9.50	35.343	. .	34.674
	47	3 Draconis	6.5	3	III–VII	83 45 1.5	0.2	5.0	2.0	1.8	6.0	2.75	31.313	. .	30.655
	48	Nadir	. .	.	. .	200 0 5.9	4.1	8.2	6.9	6.1	11.0	7.03	30.738	. .	. .
	49	Anon. 16^h 17^m 50^s .	. .	2	I, IX	82 0 2.3	1.1	4.6	0.2	2.8	5.9	2.82	27.133	. .	26.492
	50	O. Arg. S. 15615 . .	9.0	1	V	" " "	"	"	"	"	"	"	25.718	. .	25.056
	51	Radcliffe 3588 . .	. .	3	V–IX	9 44 58.8	58.0	62.6	58.0	60.4	61.4	59.87	25.788	30.662	25.102
	52	B. A. C. 5718 . . .	. .	3	III–VII	90 50 2.1	0.4	5.7	0.9	2.0	3.2	2.38	33.125	30.662	32.469
30	53	Radcliffe 3588 . .	7.5	3	IV–VI	9 45 6.0	5.8	8.9	5.0	8.5	10.6	7.47	26.062	30.664	25.395
	54	O. Arg. S. 16100 . .	8.5	3	III–VII	88 0 7.0	4.8	7.2	3.8	7.8	11.1	6.95	34.820	. .	34.161
	55	Anon. 16^h 56^m 41^s .	5.3	3	III–VII	79 10 1.5	0.8	3.9	0.8	3.1	8.2	3.05	30.397	. .	29.737
	56	B. A. C. 5818 . . .	8.0	3	III–VII	89 5 2.7	1.4	3.2	0.1	2.2	8.0	2.93	32.302	. .	31.644
	57	Anon. 17^h 20^m 1^s .	8.5	3	V–IX	56 40 . .	8.2	12.5	7.8	13.6	17.0	11.52	28.192	. .	27.527
	58	O. Arg. S. 16958 . .	7.5	3	III–VII	77 0 3.7	1 2	5.5	0.5	6.0	9.8	4.45	29.937	. .	20.276
	59	O. Arg. N. 17419 .	8.2	3	IV–VI	350 25 1.4	59.0	6.0	59.5	3.6	7.7	2.87	26.280	. .	25.608
	60	Anon. 17^h 45^m 5^s .	8.3	3	III–VII	93 25 1.2	59.4	2.8	59.0	1.5	5.1	1.50	28.609	. .	27.952
	61	Anon. 17^h 46^m 38^s .	. .	3	V–IX	" " "	"	"	"	"	"	"	37.112	. .	36.462
	62	Nadir	. .	.	. .	200 0 0.6	56.2	0.9	57.1	59.2	6.2	0.03	30.515	30.664	. .
July 12	63	ϕ^2 Lupi	5.0	3	III–VII	95 15 4.0	58.7	5.2	3.1	2.4	6.2	3.27	29.764	30.617	29.157
	64	Radcliffe 3387 . .	. .	3	III–VII	14 25 2.8	59.1	5.7	0.0	3.2	5.6	2.73	25.918	. .	25.292
	65	Lalande 28740 . .	7.0	3	IV–VI	352 45 6.4	1.3	10.9	5.6	6 2	8.5	6.48	35.335	30.617	34.711

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 1 8.6	S. 68 13 56.2	2 18.7	− 29 22 36.1	+ 18.6	Y.	
30.058	74.5	70.0	+ 2 38.1	62 2 41.5	1 45.2	23 10 47.9	15.3	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
29.950	78.0	80.2	1 26.0	71 31 26.5	2 42.2	− 32 40 29.9	25.1	Y.	
. .	. .	. .	26.3	32 30 31.7	35.0	+ 6 22 32.1	12.2	Y.	
29.952	78.2	79.0	1 16.7	70 16 22.2	2 31.6	− 31 25 15.0	23.2	Y.	
. .	. .	. .	1 39.5	21 56 38.7	22.2	+ 16 56 37.9	9.3	Y.	
. .	. .	. .	+ 1 41.3	21 56 40.5	22.2	+ 16 56 36.1	9.3	Y.	
. .	. .	. .	− 35.5	S. 72 29 27.4	2 52.3	− 33 38 40.9	23.1	Y.	
29.964	78.2	77.5	− 34.3	N. 5 0 27.5	4.8	+ 43 54 11.1	3.2	Y.	
. .	. .	. .	+ 1 1.1	S. 64 1 6.5	1 52.6	- 25 9 20.3	20.3	Y.	
29.976	78.0	77.0	+ 31.0	75 15 32.8	3 26.1	36 25 20.1	22.3	Y.	
. .	. .	. .	− 50.0	76 29 16.3	3 45.2	37 39 22.7	21.9	Y.	
. .	. .	. .	+ 4.4	69 0 4.4	2 22.9	30 8 48.5	19.9	Y.	
29.960	78.0	75.0	− 27.4	63 49 33.9	1 52.1	− 24 57 47.2	18.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	− 1 2.0	0 34 1.4	0.5	+ 38 19 36.9	5.8	Y.	
29.972	77.0	72.8	+ 1 57.5	65 17 5.0	2 0.1	− 26 25 26.3	15.0	Y.	
. .	. .	. .	− 58.0	0 44 8.3	0.7	+ 38 9 29.8	6.1	Y.	
29.980	77.0	72.4	+ 9.0	64 20 3.0	1 55.2	− 25 28 19.4	13.4	Y.	
30.066	71.8	65.3	+ 1 35.0	21 56 37.4	22.8	+ 16 56 38.6	8.8	Y.	
. .	. .	. .	− 1 36.1	21 56 38.5	22.8	+ 16 56 37.5	8.8	Y.	
. .	. .	65.1	41.9	S. 72 29 20.7	2 57.3	− 33 38 39.2	23.1	Y.	
. .	. .	. .	42.7	N. 5 0 37.3	5.0	+ 43 54 21.1	2.5	Y.	
. .	. .	. .	2 20.6	S. 68 47 42.6	2 25.0	− 29 56 28.8	21.0	Y.	
30.080	70.5	64.2	2 28.5	N. 5 32 23.8	5.5	+ 44 26 8.1	3.1	Y.	
. .	. .	. .	2 28.8	N. 27 17 18.2	29.3	+ 66 11 26.3	0.7	Y.	
30.072	70.0	64.0	30.9	S. 63 49 31.0	1 54.9	− 24 57 47.1	18.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.074	70.0	63.3	− 38.6	61 59 19.5	1 46.4	23 7 27.1	15.8	Y.	
. .	. .	. .	+ 2 8.6	67 32 13.3	2 16.6	28 40 51.1	15.9	Y.	
. .	. .	. .	53.7	67 30 58.4	2 16.4	28 39 36.0	15.8	Y.	
30.080	69.5	63.1	+ 2 27.5	68 2 27.8	2 20.1	29 11 9.1	14.7	Y.	
. .	. .	. .	− 3.2	59 10 4.3	1 35.0	20 18 0.5	12.7	Y.	
30.080	69.0	62.8	+ 2.6	74 15 7.6	3 18.9	35 24 47.7	13.5	Y.	
. .	. .	. .	− 39.5	74 14 25.5	3 18.8	35 24 5.5	13.4	Y.	
30.076	75.0	71.0	− 41.8	77 9 24.5	4 0.1	− 38 19 45.8	25.2	Y.	
. .	. .	. .	+ 1 31.2	21 56 36.9	22.6	+ 16 56 39.3	8.7	Y.	
. .	. .	. .	1 32.8	21 56 38.5	22.6	+ 16 56 37.7	8.7	Y.	
. .	. .	. .	1 6.6	70 46 10.6	2 39.0	− 31 55 10.8	22.9	Y.	
30.076	75.0	70.6	3 19.6	70 48 23.6	2 39.4	− 31 57 24.2	22.8	Y.	
. .	. .	. .	2 45.5	11 27 52.4	11.4	+ 27 25 35.0	6.0	Y.	
. .	. .	. .	+ 50.6	64 35 54.2	1 57.5	− 25 44 12.9	20.3	Y.	
. .	. .	. .	− 59.2	75 54 8.4	3 39.4	37 4 9.0	22.5	Y.	
30.084	74.0	69.2	1 55.6	S. 75 53 12.1	3 39.3	− 37 3 13.6	22.5	Y.	
. .	. .	. .	2 26.5	N. 27 17 17.0	29.0	+ 66 11 24.8	0.5	Y.	
30.090	73.8	68.4	20.5	S. 63 44 42.2	1 53.6	− 24 52 57.0	18.1	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	− 1 50.0	62 1 52.8	1 45.5	23 9 59.5	15.8	Y.	
30.098	73.5	68.8	+ 2 34.9	S. 62 2 37.8	1 45.6	− 23 10 44.6	15.8	Y.	
. .	. .	. .	+ 2 33.5	N. 10 12 26.6	10.1	+ 49 6 15.5	3.6	Y.	
30.100	73.2	69.0	− 1 17.4	S. 70 48 45.0	2 40.0	− 31 57 46.2	14.5	Y.	
29.964	78.0	76.9	+ 2 24.3	N. 10 12 28.2	9.9	+ 49 6 16.9	3.4	Y.	
. .	. .	. .	− 2 10.4	S. 67 57 56.5	2 15.4	− 29 6 33.1	14.7	Y.	
29.964	78.0	76.3	+ 8.2	59 10 11.3	1 32.2	20 18 4.7	12.6	Y.	
. .	. .	. .	− 51.5	69 4 11.4	2 23.3	− 30 12 55.9	13.0	Y.	
. .	. .	. .	+ 1 17.5	36 41 29.0	41.2	+ 2 11 28.6	8.3	Y.	
29.970	78.0	75.8	22.7	S. 57 0 27.1	1 24.9	− 18 8 13.2	10.0	Y.	
. .	. .	. .	2 17.7	N. 29 32 39.5	31.3	+ 68 26 49.6	3.8	Y.	
. .	. .	75.3	+ 1 4.2	S. 73 26 5.7	3 3.5	− 34 35 30.4	9.9	Y.	
. .	. .	. .	− 3 22.5	73 21 39.0	3 2.7	34 31 2.9	9.8	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.080	79.0	73.8	+ 26.4	S. 75 15 29.7	3 28.0	− 36 25 18.9	23.1	Y.	
. .	. .	. .	+ 2 27.5	N. 5 32 29.7	5.4	+ 44 26 13.9	+ 0.7	Y.	
30.080	78.8	72.5	− 2 27.6	N. 27 17 21.1	28.8	+ 66 11 28.7	− 1.9	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES. A.	B.	C.	D.	E.	F.	Mean.	MICROMETER. Observ'd.	Nadir cor.	Corr'd.
1877.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
July 12	1	Weisse (2) 1180 . .	7.5	3	III–VII	15 50 5.2	0.9	8.9	2.6	5.1	8.2	5.15	25.987	30.617	25.361
	2	O. Arg. N. 15872 .	8.3	2	IV, VI	349 20 6.5	2.3	13.0	6.7	8.8	9.3	7.77	29.286	. .	28.644
	3	O. Arg. N. 15882 .	8.5	2	IV, VII	349 20 6.5	"	"	"	"	"	"	30.626	. .	29.984
	4	Anon. $16^h\ 12^m\ 12^s$.	9.3	3	III–VII	21 40 0.0	55.6	1.6	56.1	1.2	4.2	59.78	25.282	. .	24.658
	5	Anon. $16^h\ 13^m\ 14^s$.	9.0	2	VII, IX	" " "	"	"	"	"	"	"	30.286	. .	29.645
	6	Anon. $16^h\ 30^m\ 52^s$.	. .	3	III–VII	87 30 3.4	59.1	3.9	0.9	1.8	5.1	2.37	31.502	. .	30.890
	7	B. A. C. 5562 . .	7.5	1	V	87 30 3.4	"	"	"	"	"	"	24.324	. .	23.707
	8	Anon. $16^h\ 44^m\ 41^s$.	9.2	3	III–VII	80 0 0.8	59.1	3.7	0.1	1.3	4.6	1.60	31.643	. .	31.030
	9	a² Herculis	. .	3	III–VII	44 20 5.0	3.1	7.5	3.5	4.9	7.9	5.32	28.143	. .	27.524
	10	Anon. $17^h\ 20^m\ 1^s$.	. .	3	V–IX	56 40 2.5	56.7	2.3	59.9	0.7	5.6	1.28	27.988	. .	27.371
	11	O. Arg. S. 16958 . .	7.5	3	III–VII	76 59 58.9	56.1	61.9	57.5	57.6	62.0	59.00	29.868	. .	29.254
	12	O. Arg. N. 17419. .	8.5	3	IV–VI	350 25 2.3	58.0	8.2	2.0	2.2	5.1	2.97	26.451	. .	25.826
	13	B. A. C. 6038 . . .	. .	1	I	93 40 3.7	2.8	7.1	5.8	3.4	7.5	5.05	26.100	. .	25.517
	14	Anon. $17^h\ 45^m\ 17^s$.	. .	2	IV, V	" " "	"	"	"	"	"	"	29.460	. .	28.844
	15	B. A. C. 6045 . . .	. .	2	V, VII	" " "	"	"	"	"	"	"	27.691	. .	27.069
	16	Lalande 33592 . .	8.0	3	III–VII	20 20 4.8	2.3	8.7	4.8	5.7	8.1	5.73	31.526	. .	30.901
	17	Nadir	. .	.	. .	200 0 1.1	58.8	4.5	0.5	0.6	5.8	1.88	30.529	30.617	. .
13	18	Radcliffe 3387 . .	. .	2	VII, IX	15 25 2.5	58.8	4.8	59.2	3.4	6.9	2.60	25.784	30.462	25.292
	19	κ Libræ	. .	3	V–IX	78 10 2.5	58.9	5.1	1.2	4.2	7.1	3.17	32.283	. .	31.828
	20	Anon. $15^h\ 42^m\ 47^s$.	8.3	3	III–VII	61 45 1.7	57.1	2.8	58.0	1.1	6.2	1.15	31.792	. .	31.331
	21	B. A. C. 5296 . .	7.0	3	III–VII	88 35 2.4	58.5	2.8	59.1	0.6	5.7	1.52	29.859	. .	29.402
	22	B. A. C. 5357 . .	. .	3	V–IX	98 35 0.5	56.8	1.2	57.4	0.2	3.5	59.93	25.436	. .	24.991
	23	Anon. $16^h\ 13^m\ 14^s$.	8.5	3	III–VII	21 40 4.3	0.8	7.2	2.3	6.2	9.2	5.00	30.271	. .	29.802
	24	Weisse (2) 616 . .	. .	3	III–VII	20 40 0.0	55.0	1.9	55.0	1.1	3.1	59.52	26.435	. .	25.965
	25	Lacaille 6894 . .	. .	3	III–VII	94 30 0.0	57.2	3.1	59.1	59.6	4.0	0.50	29.901	. .	29.446
	26	B. A. C. 5572 . .	. .	1	IX	89 10 2.2	59.1	3.5	59.8	0.7	4.9	1.70	32.752	. .	32.318
	27	B. A. C. 721 . . .	8.0	3	V–IX	90 55 5.1	0.9	6.2	1.1	3.0	7.2	3.92	29.091	. .	28.642
	28	a² Herculis	. .	3	III–VII	44 20 1.8	57.2	3.7	58.3	1.2	4.9	1.18	27.875	. .	27.411
	29	O. Arg. S. 16958 . .	7.5	3	V–IX	77 0 1.0	57.6	4.8	0.0	1.2	4.3	1.48	29.804	. .	29.349
	30	Lalande 32322 . .	8.0	3	III–VII	21 35 0.5	57.0	3.1	59.5	0.7	4.7	0.92	26.944	. .	26.475
	31	Weisse (2) 1394 . .	8.0	2	I, IX	22 45 1.6	58.6	4.2	58.9	2.2	5.2	1.78	32.234	. .	31.736
	32	Weisse (2) 1398 . .	8.3	3	III–VII	" " "	"	"	"	"	"	"	36.313	. .	35.844
	33	B. A. C. 6070 . . .	. .	3	III–VII	95 39 58.5	56.4	62.5	58.0	58.8	60.3	59.08	28.926	. .	28.471
	34	Lalande 33592 . .	. .	3	III–VII	20 20 2.7	58.9	6.0	1.4	2.8	4.7	2.75	31.335	. .	30.865
	35	Nadir	. .	.	. .	200 0 4.0	0.8	6.2	5.2	2.3	8.6	4.52	30.458	30.462	. .
14	36	κ Libræ	. .	3	III–VII	78 10 0.5	56.3	3.0	0.2	0.8	4.9	0.95	32.187	30.561	31.629
	37	Weisse (2) 1180 . .	. .	3	V–IX	15 50 4.6	0.8	6.8	1.8	3.8	8.1	4.32	25.853	. .	25.272
	38	O. Arg. S. 15194 .	7.5	3	III–VII	82 45 3.2	59.2	4.8	2.6	2.7	7.2	3.28	30.302	. .	29.745
	39	B. A. C. 5411 . . .	5.5	3	III–VII	22 10 3.1	59.1	5.8	1.2	3.3	7.2	3.28	32.549	. .	31.982
	40	O. Arg. S. 15621 . .	8.0	3	III–VII	82 0 5.8	1.2	5.9	3.3	4.7	9.0	4.98	31.919	. .	31.362
	41	Anon. $16^h\ 35^m\ 15^s$.	9.5	3	V–IX	89 0 1.9	0.1	4.9	0.9	1.8	7.1	2.78	28.888	. .	28.339
	42	Anon. $16^h\ 50^m\ 21^s$.	9.0	3	V–IX	88 55 5.4	3.9	7.4	4.3	5.1	10.1	6.03	35.028	. .	34.479
	43	28 Ophiuchi	6.5	1	V	84 19 57.8	54.8	61.0	56.1	58.7	61.3	58.28	24.390	. .	23.829
	44	31 Ophiuchi	7.0	3	V–IX	" " "	"	"	"	"	"	"	30.452	. .	29.901
	45	B. A. C. 5818 . .	7.0	3	III–VII	89 5 3.6	0.4	5.7	2.3	3.0	5.9	3.48	32.322	. .	31.767
	46	Anon. $17^h\ 16^m\ 50^s$.	. .	3	III–VII	23 34 60.2	56.1	61.8	56.8	60.1	63.4	59.73	32.205	. .	31.637
	47	B. A. C. 5960. . .	. .	2	III, V	91 0 0.9	57.3	2.8	58.4	59.3	3.0	0.28	32.639	. .	32.083
	48	Anon. $17^h\ 32^m\ 16^s$.	. .	2	VII, IX	" " "	"	"	"	"	"	"	26.274	. .	25.733
	49	B. A. C. 6038 . .	. .	1	I	93 40 4.3	2.8	6.6	4.2	4.6	8.0	5.08	26.009	. .	25.482
	50	Anon. $17^h\ 45^m\ 15^s$.	. .	2	III, V	" " "	"	"	"	"	"	"	29.335	. .	28.779
	51	B. A. C. 6045 . .	. .	3	V–IX	" " "	"	"	"	"	"	"	27.591	. .	27.044
	52	O. Arg. S. 17817 .	9.0	3	III–VII	79 55 2.8	1.1	6.1	3.2	4.1	7.1	4.07	34.441	. .	33.884
	53	Nadir	. .	.	. .	200 0 0.0	54.8	1.2	59.1	58.7	4.0	59.63	30.401	30.561	. .
30	54	σ Coronæ Borealis .	. .	2	VII, IX	24 44 56.1	48.3	56.1	48.9	54.2	57.6	53.53	33.616	30.678	32.916
	55	σ Coronæ Borealis .	. .	1	V	" " "	"	"	"	"	"	"	33.723	. .	33.045
	56	Nadir	. .	.	. .	199 59 60.0	51.3	59.5	53.1	57.7	64.1	57.62	30.454	30.678	. .
31	57	σ Coronæ Borealis .	. .	2	I, IX	24 45 3.8	56.8	3.1	58.8	1.6	6.0	1.68	33.897	30.655	33.209
	58	σ Coronæ Borealis .	. .	3	III–VII	" " "	"	"	"	"	"	"	33.992	. .	33.331
	59	ρ Ophiuchi (1st *) . .	. .	2	IV, VI	82 5 3.0	56.4	3.5	58.1	1.6	5.1	1.28	36.568	. .	35.915
	60	ρ Ophiuchi (2d *) . .	. .	2	V, IX	" " "	"	"	"	"	"	"	36.734	. .	36.093
	61	Lacaille 6999 . .	7.0	3	III–VII	96 10 3.1	58.4	4.9	58.1	2.9	5.9	2.22	34.078	. .	33.430
	62	B. A. C. 5700 (1st *)	9.0	3	V–IX	78 15 3.2	58.8	5.1	59.8	3.4	7.2	2.92	34.585	. .	33.937
	63	O. Arg. S. 16420 .	7.5	3	III–VII	82 25 2.0	57.9	4.3	59.8	2.2	6.9	2.18	31.297	. .	30.647
	64	Anon. $17^h\ 16^m\ 50^s$.	9.0	3	V–IX	23 35 3.7	58.9	4.9	59.9	4.8	8.0	3.37	32.632	. .	31.962
	65	B. A. C. 5960 . .	7.0	3	III–VII	90 59 60.2	55.8	61.9	56.7	59.7	63.2	59.58	32 630	30.655	31.981

Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1870.0.	Observer.	REMARKS.
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	+ 2 25.4	N. 4 7 29.5	4.0	+ 43 1 12.3	+ 1.0	Y.	
. .	. .	. .	42.5	30 39 9.7	33.1	69 33 21.6	− 1.7	Y.	
30.082	78.0	72.0	0.5	N. 30 39 51.7	33.2	69 34 3.7	− 1.7	Y.	
. .	. .	. .	2 47.4	S. 1 42 47.2	1.7	37 10 49.9	+ 2.1	Y.	
. .	. .	. .	+ 11.1	1 40 10.9	1.6	+ 37 13 26.3	2.1	Y.	
. .	. .	70.8	− 27.9	67 29 34.5	2 14.2	− 28 38 9.9	16.4	Y.	
. .	. .	. .	+ 3 17.2	67 33 19.6	2 14.6	28 41 55.4	16.2	Y.	
30.086	77.5	70.4	− 32.3	59 59 29.3	1 36.7	− 21 7 27.2	13.6	Y.	
. .	. .	. .	+ 1 17.6	24 21 22.9	25.4	+ 14 31 50.5	5.2	Y.	
. .	. .	. .	1 22.4	36 41 23.7	41.8	+ 2 11 33.3	6.8	Y.	
30.080	76.0	69.4	23.4	S. 57 0 22.4	1 26.2	− 18 8 9.6	9.8	Y.	
. .	. .	. .	2 10.8	N. 29 32 46.2	31.8	+ 68 26 56.8	0.2	Y.	
. .	. .	. .	2 20.5	S. 73 42 25.5	3 9.5	− 34 51 56.2	10.8	Y.	
. .	. .	. .	36.2	73 40 41.3	3 9.3	34 50 11.8	10.8	Y.	
30.076	76.0	68.8	1 31.8	73 41 36.9	3 9.5	− 34 51 7.6	10.7	Y.	
30.070	75.5	68.0	− 2 28.2	S. 0 19 37.5	0.3	+ 38 34 1.0	1.3	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	.	
30.008	78.5	73.3	+ 2 27.5	N. 5 32 29.9	5.4	+ 44 26 14.1	0.5	Y.	
. .	. .	. .	− 57.3	S. 58 9 5.9	1 29.5	− 19 16 56.6	17.2	Y.	
30.106	78.0	73.0	− 41.7	41 44 19.4	49.8	2 51 30.4	12.1	Y.	
. .	. .	. .	+ 18.7	68 35 20.3	2 21.8	29 44 3.3	19.3	Y.	
30.200	78.0	72.0	2 37.0	78 37 36.9	4 31.0	− 39 48 29.1	21.2	Y.	
. .	. .	. .	6.2	1 40 11.2	1.6	+ 37 13 26.0	1.9	Y.	
. .	. .	. .	2 6.4	0 42 6.0	0.7	+ 38 11 32.1	1.7	Y.	
. .	. .	71.7	+ 17.3	74 30 17.8	3 19.4	− 35 39 58.4	18.2	Y.	
. .	. .	. .	− 1 12.7	69 8 49.0	2 26.2	30 17 36.4	16.5	Y.	
30.202	77.0	71.0	+ 42.6	70 55 46.5	2 41.0	− 32 4 48.7	15.2	Y.	
. .	. .	. .	1 21.1	24 21 22.3	25.5	+ 14 31 51 0	5.0	Y.	
. .	. .	. .	20.4	57 0 21.9	1 26.4	− 18 8 9.5	9.8	Y.	
. .	. .	. .	+ 1 50.5	1 36 51.4	1.6	+ 37 16 45.8	1.4	Y.	
. .	. .	. .	− 54.4	2 44 7.4	2.7	36 9 28.7	1.4	Y.	
. .	. .	. .	− 3 3.1	2 41 58.6	2.7	+ 36 11 37.5	1.4	Y.	
30.200	76.0	69.6	+ 47.9	75 40 47.0	3 36.7	− 36 50 44.9	10.6	Y.	
. .	. .	. .	− 27.1	0 19 35.7	0.3	38 34 2.8	1.0	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	.	
30.050	78.0	75.0	− 51.1	S. 58 9 9.9	1 29.1	− 19 17 0.2	17.5	Y.	
. .	. .	. .	+ 2 18.1	N. 4 7 27.5	4.0	+ 43 1 10.3	0.7	Y.	
30.050	77.8	74.2	+ 8.0	S. 62 45 11.3	1 47.5	− 23 53 20.0	17.4	Y.	
. .	. .	. .	− 1 2.1	2 9 1.2	2.1	+ 36 44 35.5	1.8	Y.	
. .	. .	. .	− 42.7	61 59 22.3	1 44.2	− 23 7 27.7	15.9	Y.	
30.060	77.2	73.2	+ 52.1	69 0 54.9	2 24.1	30 9 40.2	16.4	Y.	
. .	. .	. .	− 2 20.4	68 52 45.7	2 23.1	30 1 30.0	15.2	Y.	
. .	. .	. .	+ 3 13.4	64 23 11.7	1 55.7	25 31 28.6	13.7	Y.	
30.056	77.0	72.7	+ 3.1	64 20 1.4	1 55.5	25 28 18.1	13.7	Y.	
. .	. .	. .	− 55.4	69 4 8.1	2 24.7	− 30 12 54.0	13.6	Y.	
. .	. .	. .	51.3	3 34 8.4	3.5	+ 35 19 26.9	1.5	Y.	
. .	. .	. .	− 1 5.3	70 58 55.0	2 40.6	− 32 7 56.8	11.8	Y.	
30.060	76.0	71.3	+ 2 13.7	71 2 14.0	2 41.1	32 11 16.7	11.8	Y.	
. .	. .	. .	2 21.6	73 42 26.7	3 18.8	34 51 56.7	11.0	Y.	
. .	. .	. .	38.2	73 40 43.3	3 8.6	34 50 13.1	10.9	Y.	
. .	. .	. .	+ 1 32.6	73 41 37.7	3 8.6	34 51 7.5	10.8	Y.	
30.056	75.6	71.0	− 2 1.3	59 53 2.8	1 36.1	− 21 0 59.1	+ 6.9	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	1 31.4	4 43 22.2	4.5	+ 34 10 12.1	0.0	Y.	
29.914	85.0	80.6	1 35.4	4 43 18.1	4.5	34 10 16.2	0.0	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	1 40.6	4 43 21.1	4.5	34 10 13.1	− 0.1	Y.	
30.060	83.0	79.7	1 44.4	4 43 17.3	4.6	+ 34 10 16.9	− 0.1	Y.	
. .	. .	. .	3 5.4	62 1 55.9	1 43.2	− 23 10 0.3	+ 15.9	Y.	
. .	. .	. .	3 11.0	62 1 50.3	1 43.2	23 9 54.7	15.9	Y.	
. .	. .	. .	1 47.5	76 8 14.7	3 39.0	37 18 14.8	18.4	Y.	
30.070	82.0	78.7	2 3.4	58 12 59.6	1 28.7	19 20 49.5	12.7	Y.	
. .	. .	. .	20.3	65 24 41.9	1 59.9	− 26 33 3.0	+ 13.7	Y.	
. .	. .	. .	1 1.5	3 34 1.9	3.4	+ 35 19 33.5	− 1.9	Y.	
. .	. .	. .	− 1 2.1	S. 70 58 57.5	2 39.3	− 32 7 58.0	+ 12.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. July 31	1	B. A. C. 5964	7.5	3	V–IX	90 59 60.2	55.8	61.9	56.7	59.7	63.2	59.58	30.763	30.655	30.122
	2	Anon. $17^h 42^m 15^s$	8.0	3	III–VII	89 45 3.9	1.4	5.9	2.0	3.1	6.9	3.87	27.943	. .	27.294
	3	Anon. $17^h 43^m 17^s$	9.0	2	VII, IX	" " "	"	"	"	"	"	"	28.081	. .	27.445
	4	O. Arg. S. 17506 (1st *)	9.5	2	I, IX	81 55 6.0	1.7	7.0	2.8	5.0	9.1	5.27	33.156	. .	32.522
	5	O. Arg. S. 17506 (2d *)	8.3	3	III–VII	" " "	"	"	"	"	"	"	. .	. .	32.731
	6	Anon. $18^h 4^m 25^s$	. .	2	III, VII	79 15 1.5	59.1	4.8	0.6	2.4	6.8	2.53	28.938	. .	28.288
	7	Anon. $18^h 16^m 34^s$	9.0	2	I, IX	88 25 3.8	0.4	4.9	0.4	3.2	7.2	3.32	25.782	. .	25.154
	8	Anon. $18^h 16^m 34^s$	8.3	3	III–VII	" " "	"	"	"	"	"	"	27.587	. .	26.937
	9	Anon. $18^h 25^m 18^s$	8.5	3	V–IX	95 45 6.2	2.8	9.7	4.2	6.9	10.0	6.63	33.189	. .	32.550
	10	Anon. $18^h 35^m 52^s$	7.5	3	III–VII	60 0 1.4	56.6	6.0	59.2	3.1	8.0	2.38	32.584	. .	31.929
	11	Weisse 887	. .	2	VII, IX	" " "	"	"	"	"	"	"	36.295	. .	35.641
	12	Anon. $18^h 47^m 52^s$	. .	2	V, VII	92 15 0.0	55.2	1.2	57.0	58.3	1.8	0.58	29.528	. .	28.878
	13	Anon. $18^h 48^m 15^s$	. .	2	VII, IX	" " "	"	"	"	"	"	"	28.190	. .	27.556
	14	O. Arg. S. 19104	8.0	3	III–VII	80 49 58.7	52.8	60.5	53.9	57.3	60.8	57.33	29.129	. .	28.478
	15	Gr. Cat. 1710	6.0	3	IV–VI	12 10 4.8	0.5	8.9	5.0	7.2	9.0	5.90	35.554	. .	34.896
	16	Nadir	. .	.	. .	199 59 60.7	51.9	61.3	57.2	58.5	65.7	59.72	30.497	30.655	. .
Aug. 3	17	σ Coronæ Borealis	. .	2	I, IX	24 45 3.5	58.3	3.9	0.7	3.8	6.1	2.72	34.164	30.761	33.370
	18	σ Coronæ Borealis	. .	2	III, VII	" " "	"	"	"	"	"	"	33.976	. .	33.205
	19	ω Ophiuchi	5.0	3	III–VII	80 4 52.2	55.8	61.9	56.0	61.2	64.5	58.60	31.895	. .	31.138
	20	Radcliffe 3588	6.5	3	IV–VI	9 45 4.1	0.2	6.1	1.1	6.8	8.0	4.38	26.312	. .	25.548
	21	O. Arg. S. 16060	. .	3	III–VII	89 5 5.6	3.4	7.8	3.8	6.7	10.9	6.37	33.806	. .	33.051
	22	Weisse (2) 1735	6.0	3	III–VII	33 15 1.8	0.2	4.1	0.3	5.8	7.5	3.28	35.400	. .	34.634
	23	O. Arg. S. 16420	. .	3	III–VII	85 25 3.1	0.0	6.0	2.1	5.2	8.2	4.10	31.424	. .	30.668
	24	Anon. $17^h 16^m 6^s$	7.0	2	VII, IX	23 25 2.4	59.4	4.0	59.6	4.1	7.8	2.88	33.052	. .	32.269
	25	B. A. C. 5960	7.0	2	I, IX	91 0 2.3	57.8	1.8	58.8	0.8	3.8	0.88	32.678	. .	31.948
	26	Anon. $17^h 32^m 16^s$	7.0	3	III–VII	" " "	"	"	"	"	"	"	26.277	. .	25.522
	27	Lacaille 7464	. .	2	III, VII	93 50 2.4	58.9	2.9	59.7	3.4	6.2	2.25	31.120	. .	30.369
	28	Anon. $17^h 45^m 12^s$	. .	2	III, VII	" " "	"	"	"	"	"	"	31.162	. .	30.411
	29	Anon. $17^h 57^m 19^s$	9.0	3	III–VII	82 30 4.1	0.2	4.8	2.4	5.2	8.3	4.17	34.507	. .	33.750
	30	O. Arg. S. 17817	9.0	3	V–IX	79 55 3.1	0.8	6.1	2.1	5.8	8.2	4.35	34.722	. .	33.969
	31	Anon. $18^h 16^m 33^s$	8.3	2	I, IX	88 24 60.2	56.8	61.7	56.0	60.6	64.2	59.92	27.634	. .	26.901
	32	Anon. $18^h 16^m 34^s$	8.5	3	IV–VI	" " "	"	"	"	"	"	"	25.729	. .	24.970
	33	Anon. $18^h 25^m 20^s$	9.0	3	V–IX	95 40 5.1	3.4	8.6	4.3	6.7	8.7	6.13	28.194	. .	27.449
	34	Anon. $18^h 35^m 52^s$	7.5	3	IV–VI	60 0 4.8	1.2	6.8	1.9	7.2	10.4	5.38	32.769	. .	32.008
	35	Anon. $18^h 38^m 18^s$	9.0	3	III–VII	" " "	"	"	"	"	"	"	30.740	. .	29.979
	36	Anon. $18^h 47^m 52^s$	. .	1	V	92 15 5.0	2.2	8.2	5.3	6.2	10.1	6.17	29.839	. .	29.078
	37	Anon. $18^h 48^m 15^s$	. .	2	VII, IX	" " "	"	"	"	"	"	"	28.505	. .	27.766
	38	O. Arg. S. 19104	8.2	3	III–VII	80 50 3.7	0.3	5.3	1.6	4.4	7.5	3.80	29.350	. .	28.593
	39	Gr. Cat. 1710	6.0	3	IV–VI	12 10 1.8	59.8	5.7	2.3	5.2	7.7	3.75	35.543	. .	34.779
	40	Anon. $19^h 22^m 18^s$	8.3	3	III–VII	23 55 6.1	2.2	8.1	3.3	7.2	8.8	5.95	26.036	. .	25.268
	41	Nadir	. .	.	. .	200 0 2.0	57.4	4.2	0.7	3.8	8.1	2.70	30.696	30.761	. .
4	42	Lacaille 6930	6.0	3	III–VII	91 45 2.2	59.5	2.9	1.9	2.8	6.1	2.57	29.942	30.571	29.377
	43	Lacaille 7023	7.0	3	III–VII	91 55 5.1	2.6	6.9	3.8	6.2	9.3	5.65	29.629	. .	29.064
	44	Anon. $16^h 50^m 21^s$	9.0	2	VII, IX	88 55 4.7	2.7	6.1	2.7	5.7	9.2	5.18	34.954	. .	34.401
	45	Weisse (2) 1735	6.0	2	III–VII	33 15 3.2	1.5	4.5	1.6	5.8	8.9	4.25	35.307	. .	34.731
	46	B. A. C. 5800	6.0	3	III–VII	85 44 59.4	55.9	62.2	59.8	61.6	63.6	0.42	36.474	. .	35.908
	47	Anon. $17^h 16^m 50^s$	. .	3	V–IX	23 35 2.0	56.6	3.2	57.4	3.2	4.1	1.08	32.438	. .	31.852
	48	Anon. $17^h 26^m 30^s$	9.0	1	V	97 20 6.0	6.0	9.8	6.0	7.2	9.8	7.47	27.647	. .	27.076
	49	Anon. $17^h 27^m 30^s$	9.0	1	V	" " "	"	"	"	"	"	"	29.932	. .	29.361
	50	O. Arg. N. 17419	8.0	1	V	350 25 5.4	1.7	11.6	3.9	7.8	9.2	6.60	26.640	. .	26.069
	51	Anon. $17^h 45^m 15^s$	8.5	2	I, IX	93 30 1.8	59.3	4.0	1.4	2.7	5.0	2.37	29.939	. .	29.402
	52	B. A. C. 6037	7.0	1	V	" " "	"	"	"	"	"	"	25.603	. .	25.032
	53	Anon. $17^h 57^m 22^s$	9.0	3	III–VII	82 30 4.5	1.7	6.1	3.0	5.3	7.0	4.60	34.659	. .	34.092
	54	O. Arg. S. 17817	. .	3	III–VII	79 55 2.1	0.3	5.2	2.0	4.1	6.8	3.42	34.511	. .	33.944
	55	B. A. C. 6270 (1st *)	. .	2	I, IX	85 30 2.9	59.7	6.1	4.2	4.6	7.2	4.12	28.545	. .	27.999
	56	B. A. C. 6270 (2d *)	. .	3	III–VII	" " "	"	"	"	"	"	"	27.240	. .	26.674
	57	B. A. C. 6321	6.0	2	VII, IX	88 40 3.1	2.8	7.7	4.1	5.7	9.1	5.42	32.562	. .	32.009
	58	Weisse 887	. .	3	III–VII	60 0 1.8	58.4	5.5	1.0	3.7	8.0	3.07	36.246	. .	35.675
	59	Lacaille 7926	7.0	2	III, VII	92 19 58.3	57.8	62.7	59.4	60.0	61.4	59.93	30.640	. .	30.078
	60	Anon. $18^h 48^m 53^s$	9.0	1	V	" " "	"	"	"	"	"	"	32.285	. .	31.714
	61	O. Arg. S. 19202	9.0	3	III–VII	88 35 2.1	59.5	4.6	58.9	1.7	4.3	1.85	29.541	. .	28.975
	62	Gr. Cat. 1710	6.0	3	III–VII	12 10 5.5	5.0	11.8	8.0	9.7	11.1	8.52	35.580	. .	34.999
	63	Anon. $19^h 22^m 18^s$	8.2	3	III–VII	23 55 3.3	2.1	8.0	3.9	6.4	8.1	5.30	25.870	. .	25.292
	64	Anon. $19^h 30^m 20^s$	9.0	1	IX	19 55 3.8	3.8	9.8	5.0	8.2	8.4	6.50	29.600	. .	28.989
	65	Anon. $19^h 30^m 23^s$	8.5	2	V, VII	" " "	"	"	"	"	"	"	33.743	30.571	33.166

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
30.084	81.3	77.5	− 3.8	S. 70 59 55.8	2 39.3	− 32 8 56.3	+ 12.6	Y.	
. .	. .	. .	+ 1 24.8	69 46 28.7	2 29.2	30 55 19.1	11.4	Y.	
. .	. .	. .	+ 1 20.1	69 46 24.0	2 28.9	30 55 14.1	11.3	Y.	
. .	. .	. .	− 1 19.1	61 53 46.2	1 43.2	23 1 50.6	8.4	Y.	
. .	. .	77.3	− 1 25.6	61 53 39.7	1 43.2	23 1 44.1	8.4	Y.	
. .	. .	. .	+ 53.7	59 15 56.2	1 32.8	20 23 50.2	6.9	Y.	
. .	. .	. .	2 31.9	68 27 35.2	2 19.2	29 36 15.6	7.7	Y.	
30.100	80.8	77.0	+ 1 36.0	68 26 39.3	2 19.1	29 35 19.6	7.6	Y.	
. .	. .	. .	− 1 19.9	75 43 46.7	3 33.8	36 53 41.7	8.1	Y.	
. .	. .	. .	1 0 5	39 59 1.9	46.5	1 6 9.6	2.1	Y.	
. .	. .	76.5	− 2 56.8	39 57 5.6	46.5	1 4 13.3	0.5	Y.	
. .	. .	. .	+ 35.1	72 15 35.7	2 51.4	33 24 48.3	4.9	Y.	
30.100	80.2	76.0	1 16.6	72 16 17.2	2 51.5	33 25 29.9	4.9	Y.	
. .	. .	. .	+ 47.7	S. 60 50 45.0	1 39.1	− 21 58 45.3	+ 1.6	Y.	
30.104	80.0	75.6	− 2 33.4	N. 7 52 27.5	7.7	+ 46 46 14.0	− 5.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	1 45.6	S. 4 43 17.1	4.5	34 10 17.2	0.3	Y.	
29.888	79.5	77.3	1 40.4	4 43 22.3	4.5	+ 34 10 12.0	− 0.3	Y	
. .	. .	. .	− 35.7	S. 6 4 22.9	1 35.2	− 21 12 19.3	+ 15.0	Y.	
29.894	79.0	76.7	+ 2 19.5	N. 10 12 36.1	9.9	+ 49 6 24.8	− 3.3	Y.	
. .	. .	. .	− 1 35.6	S. 69 3 30.7	2 22.7	− 30 12 14.6	+ 16.3	Y.	
. .	. .	. .	2 25.2	13 12 38.1	12.9	+ 25 40 47.8	0.1	Y.	
29.902	79.0	76.0	20.9	65 24 43.2	1 59.8	− 26 33 4.2	+ 13.8	Y.	
. .	. .	. .	1 11.1	3 23 51.8	3.3	+ 35 29 43.7	− 2.3	Y.	
. .	. .	. .	− 1 1.1	70 58 59.8	2 38.7	− 32 7 59.7	+ 12.9	Y.	
29.906	78.7	74.7	+ 2 20.3	71 2 21.2	2 39.3	32 11 21.7	12.9	Y.	
. .	. .	. .	− 11.6	73 49 50.7	3 8.0	34 59 19.9	12.4	Y.	
. .	. .	. .	12.9	73 49 49.4	3 8.0	34 59 18.6	12.4	Y.	
. .	. .	. .	1 57.5	62 28 6.6	1 45.7	23 36 13.5	8.4	Y.	
29.906	78.0	74.1	− 2 4.4	59 53 0.0	1 35.1	21 0 56.3	7.0	Y.	
. .	. .	. .	+ 1 37.1	68 26 37.0	2 19.0	29 35 17.2	7.9	Y.	
. .	. .	. .	2 37.7	68 27 37.6	2 19.1	29 36 17.9	7.9	Y.	
. .	. .	73.8	+ 1 20.0	75 41 26.1	3 33.1	36 51 20.4	8.5	Y.	
. .	. .	. .	− 1 2.9	39 59 2.4	46.4	1 6 10.0	+ 0.4	Y.	
25.900	77.5	74.0	+ 0.7	40 0 6.0	46.4	1 7 13.6	− 0.2	Y.	
. .	. .	. .	28.9	72 15 35.0	2 51.0	33 24 47.2	+ 5.2	Y.	
. .	. .	. .	1 10.0	72 16 16.2	2 51.2	33 25 28.6	5.0	Y.	
. .	. .	. .	+ 44 1	S. 60 50 47.9	1 38.9	− 21 58 48.0	+ 1.8	Y.	
. .	. .	. .	− 2 29.9	N. 7 52 26.1	7.7	+ 46 46 12.6	− 6.0	Y.	
29.900	77.0	73.2	+ 2 28.3	S. 3 57 34.2	3.8	+ 34 56 0.8	− 5.9	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.000	77.2	73.0	19.5	71 45 22.1	2 47.9	− 32 54 31.2	+ 18.1	Y.	
. .	. .	. .	+ 29.3	71 55 35.0	2 48.6	33 4 44.8	17.3	Y.	
. .	. .	. .	− 2 17.9	68 52 47.2	2 23.0	− 30 1 31.4	16.0	Y.	
30.004	77.0	72.5	− 2 28.2	13 12 36.0	13.1	+ 25 40 49.7	0.0	Y.	
. .	. .	. .	+ 3 5.1	65 41 55.3	2 2.5	− 26 50 19.0	+ 13.7	Y.	
. .	. .	. .	− 58.0	3 34 3.0	3.5	+ 35 19 32.3	− 2.4	Y.	
. .	. .	. .	+ 1 31.6	77 21 39.1	4 3.2	− 38 32 3.5	+ 15.2	Y.	
30.006	76.8	71.0	+ 20.0	S. 77 20 27.5	4 2.9	− 38 30 51.6	+ 15.1	Y.	
. .	. .	. .	− 2 3.2	N. 29 36 56 6	31.8	+ 68 31 7.2	− 5.5	Y.	
. .	. .	. .	+ 18.7	S. 73 30 21.1	3 6.4	− 34 39 48.7	+ 12.4	Y.	
. .	. .	. .	− 2 35.7	73 32 38.1	3 6 8	34 42 6.1	12.4	Y.	
. .	. .	. .	2 8.2	62 27 56.4	1 47.5	23 36 5.1	8.4	Y.	
30.114	75.5	68.8	− 2 3.6	59 52 59.8	1 36.8	21 0 57.8	7.1	Y.	
. .	. .	. .	+ 1 2.7	65 31 6.8	2 2.9	26 39 30.9	6.8	Y.	
. .	. .	. .	+ 1 44.2	65 31 48.4	2 2.9	26 40 2.5	6.8	Y.	
. .	. .	. .	− 1 3.0	68 39 2.4	2 22.7	29 47 46.3	6.8	Y.	
30.006	74.5	68.0	2 57.9	39 57 5.2	47.0	1 4 13.4	0.2	Y	
. .	. .	. .	2.4	72 19 57.5	2 54.4	33 29 13.1	5.2	Y.	
. .	. .	. .	− 53.7	72 19 6.2	2 54.3	33 28 21.7	5.2	Y.	
30.006	74.0	67.0	+ 32.1	S. 68 35 34.0	2 22.4	− 29 44 17.6	+ 2.8	Y.	
. .	. .	. .	− 2 36.7	N. 7 52 28.1	7.8	+ 46 46 14.7	− 6.3	Y.	
. .	. .	. .	+ 2 27.5	S. 3 57 32 8	3.9	34 56 2.1	6.1	Y.	
. .	. .	. .	+ 31.7	N. 0 4 21.8	0.1	38 58 0.7	6.5	Y.	
. .	. .	. .	− 1 39.2	N. 0 6 32.7	0.1	+ 39 0 11.6	− 6.5	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES. A.	B.	C.	D.	E.	F.	Mean.	MICROMETER. Observ'd.	Nadir cor.	Corr'd.
1877.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
Aug. 4	1	Anon. $19^h 39^m 27^s$	. .	3	III-VII	20 50 0.9	0.1	5.5	0.0	3.7	4.5	2.45	33.719	30.571	33.140
	2	Nadir	. .	.	. .	200 0 0.2	57.4	3.7	1.1	0.2	5.5	1.35	30.468	30.571	. .
18	3	B. A. C. 5932	5.0	3	III-VII	97 20 4.2	59.4	7.0	55.3	6.3	4.1	2.72	25.663	30.516	25.155
	4	O. Arg. N. 17415	8.2	3	IV-VI	350 25 3.4	59.2	9.9	58.9	8.4	5.0	4.13	26.643	. .	26.120
	5	O. Arg. S. 17394	9.0	3	III-VII	83 55 1.0	56.1	5.5	54.3	4.9	1.0	0.47	29.238	. .	28.727
	6	B. A. C. 6125	6.5	3	III-VII	80 19 60.1	56.0	65.0	53.7	64.1	60.5	59.90	31.740	. .	31.228
	7	Lalande 33210	6.5	3	III-VII	" " "	"	"	"	"	"	"	30.589	. .	30.077
	8	O. Arg. S. 17956	. .	3	V-IX	77 44 61.2	55.4	64.2	52.8	63.6	60.5	59.62	34.469	. .	33.960
	9	O. Arg. N. 18534	8.2	3	IV-VI	346 35 2.2	55.7	7.1	53.4	4.8	1.4	0.77	29.140	. .	28.615
	10	Lalande 35006	7.5	1	V	" " "	"	"	"	"	"	"	24.950	. .	24.434
	11	Lacaille 7926	. .	2	III, VII	92 20 2.2	58.2	6.2	54.7	4.2	1.0	1.08	30.643	. .	30.137
	12	Weisse 1549	8.0	2	VII, IX	60 20 4.6	58.0	7.2	56.8	6.2	5.0	2.97	28.806	. .	28.291
	13	Anon. $19^h 11^m 34^s$	9.0	3	III-VII	20 24 60.4	54.8	64.0	53.0	64.6	60.1	59.48	31.196	. .	30.672
	14	Weisse (2) 556	9.5	3	III-VII	22 0 4.5	0.7	9.2	59.5	9.8	6.1	4.97	35.238	. .	34.715
	15	Anon. $19^h 19^m 46^s$	9.0	1	IX	" " "	"	"	"	"	"	"	30.682	. .	30.130
	16	Anon. $19^h 32^m 0^s$	5.5	3	III-VII	69 20 2.9	59.2	7.8	58.1	6.7	3.8	3.08	33.704	. .	33.190
	17	Anon. $19^h 39^m 27^s$	9.0	3	III-VII	20 50 5.9	2.0	10.2	58.1	9.4	7.1	5.45	33.919	. .	33.395
	18	Weisse 1208	9.0	3	III-VII	67 55 0.6	56.7	6.1	55.0	4.9	3.0	1.05	26.931	. .	26.417
	19	Anon. $19^h 57^m 46^s$	9.3	3	III-VII	23 55 5.1	2.2	11.1	59.6	9.2	4.0	5.20	30.077	. .	29.554
	20	Weisse XX, 46	7.0	2	VII, IX	68 5 2.7	59.5	9.9	59.0	7.7	5.3	4.02	31.138	. .	30.627
	21	Anon. $20^h 15^m 9^s$	9.0	3	III-VII	22 10 1.2	57.2	6.9	54.6	5.3	2.6	1.30	32.691	. .	32.168
	22	Nadir	. .	.	. .	199 59 59.9	54.4	64.7	53.0	62.9	61.0	59.32	30.346	30.516	. .
20	23	Anon. $17^h 52^m 43^s$	9.5	1	V	342 20 2.7	55.8	9.6	55.4	6.2	1.6	1.88	24.784	30.758	24.026
	24	Anon. $18^h 4^m 25^s$	8.5	3	V-IX	79 15 4.3	0.2	8.4	58.0	7.7	5.3	3.98	29.144	. .	28.394
	25	Lacaille 7662	6.0	3	III-VII	96 25 1.7	56.8	6.2	55.8	5.3	1.6	1.23	35.840	. .	35.089
	26	Lalande 34412	8.0	3	III-VII	21 35 2.7	58.4	6.2	54.2	7.8	4.0	2.23	34.425	. .	33.660
	27	O. Arg. N. 18534	. .	2	IV, V	346 35 5.8	59.6	12.5	58.9	10.7	7.1	5.77	29.508	. .	28.743
	28	Anon. $18^h 37^m 21^s$	8.7	1	VI	" " "	"	"	"	"	"	"	28.360	. .	27.588
	29	Lalande 35006	. .	1	VI	" " "	"	"	"	"	"	"	25.330	. .	24.588
	30	Anon. $18^h 47^m 52^s$	7.5	2	III, V	92 14 60.7	55.5	64.6	55.7	62.1	59.7	59.72	29.596	. .	28.843
	31	Anon. $18^h 48^m 15^s$	8.0	3	V-IX	" " "	"	"	"	"	"	"	28.263	. .	27.519
	32	O. Arg. S. 19140	8.5	3	III-VII	74 20 5.7	58.8	8.9	59.0	8.4	4.4	4.20	29.195	. .	28.440
	33	Anon. $19^h 11^m 30^s$	8.5	3	III-VII	20 25 4.7	59.0	8.8	57.9	8.8	4.0	3.87	31.496	. .	30.730
	34	Anon. $19^h 19^m 20^s$	. .	3	III-VII	22 0 3.7	58.1	8.7	57.8	8.7	5.2	3.70	34.879	. .	34.114
	35	Anon. $19^h 20^m 47^s$	. .	3	V-IX	" " "	"	"	"	"	"	"	29.772	. .	28.998
	36	Anon. $19^h 32^m 0^s$	5.5	3	III-VII	69 20 3.1	57.2	8.9	58.8	7.4	5.2	3.43	33.860	. .	33.104
	37	Anon. $19^h 39^m 27^s$	8.8	3	III-VII	20 49 61.8	54.7	64.6	52.7	64.6	61.3	59.95	33.807	. .	33.041
	38	Anon. $19^h 49^m 42^s$	8.5	3	III-VII	96 50 1.8	55.8	6.8	54.8	4.3	1.0	0.75	32.722	. .	31.971
	39	Weisse XX, 46	6.0	3	III-VII	68 5 4.4	0.7	10.9	59.1	8.9	6.9	5.15	31.344	. .	30.588
	40	Anon. $20^h 15^m 9^s$	8.5	3	III-VII	22 10 1.7	57.2	6.8	54.3	5.7	2.2	1.32	32.900	. .	32.135
	41	Nadir	. .	.	. .	200 0 5.7	0.0	9.8	59.1	8.0	6.5	4.85	30.763	30.758	. .
21	42	60 Herculis	. .	3	III-VII	46 0 5.7	0.2	8.0	57.7	9.6	5.2	4.40	33.648	30.645	33.001
	43	α^2 Herculis	. .	3	III-VII	44 19 61.0	54.0	62.9	52.0	63.7	60.0	58.93	28.088	. .	27.441
	44	B. A. C. 5875	. .	3	III-VII	87 10 3.6	56.8	6.8	55.8	5.2	2.9	1.85	30.952	. .	30.312
	45	O. Arg. S. 16952	7.5	3	III-VII	77 0 2.8	54.7	5.1	53.2	5.2	2.9	0.65	29.953	. .	29.311
	46	Anon. $17^h 37^m 9^s$	7.2	3	IV-VI	350 20 2.2	53.3	6.2	53.0	4.5	1.1	0.05	29.712	. .	29.059
	47	Anon. $17^h 46^m 4^s$	9.0	3	III-VII	50 10 8.7	1.6	10.6	59.5	11.7	9.4	6.92	31.062	. .	30.416
	48	O. Arg. S. 17506	. .	3	III-VII	81 55 4.5	58.1	7.9	57.2	5.8	3.7	2.87	33.380	. .	32.739
	49	Anon. $18^h 4^m 25^s$	8.5	3	III-VII	79 15 1.9	57.0	5.9	55.8	5.7	3.1	1.57	28.960	. .	28.319
	50	B. A. C. 6270	. .	3	III-VII	85 29 60.1	53.1	63.8	53.7	62.5	59.5	58.78	28.521	. .	27.881
	51	O. Arg. N. 18539	. .	1	V	346 35 7.1	0.4	12.8	58.0	11.0	7.5	6.13	29.470	. .	28.825
	52	Anon. $18^h 37^m 21^s$	. .	1	V	" " "	"	"	"	"	"	"	28.541	. .	27.896
	53	Lalande 35006	. .	1	V	" " "	"	"	"	"	"	"	25.263	. .	24.618
	54	Anon. $18^h 52^m 25^s$	9.0	2	III, VII	67 15 1.0	55.3	6.0	54.1	4.7	2.3	0.57	26.964	. .	26.320
	55	O. Arg. S. 19140	8.5	3	III-VII	74 20 3.2	58.2	6.9	57.1	6.1	2.3	2.30	28.936	. .	28.294
	56	Anon. $19^h 11^m 34^s$	9.0	3	V-IX	20 25 6.4	1.4	11.2	59.0	10.6	6.3	5.82	31.478	. .	30.816
	57	Anon. $19^h 24^m 15^s$	8.3	3	III-VII	21 54 58.9	54.8	63.5	53.9	63.8	60.1	59.17	26.447	. .	25.795
	58	Nadir	. .	.	. .	200 0 4.0	58.4	8.0	58.2	7.2	5.9	3.62	30.612	. .	. .
	59	Anon. $20^h 13^m 27^s$	. .	3	III-VII	92 0 4.1	59.2	8.0	58.2	6.7	4.4	3.43	34.314	. .	33.675
	60	O. Arg. S. 20578	7.0	3	III-VII	84 10 2.7	58.2	7.3	57.0	5.5	2.4	2.18	33.350	. .	32.710
	61	Lacaille 8513	. .	3	III-VII	95 5 4.7	1.4	8.5	0.0	8.4	4.9	4.65	32.962	30.645	32.324
Sept. 3	62	B. A. C. 6029	6.0	3	III-VII	93 35 2.7	0.3	6.6	0.0	4.8	1.0	2.57	27.675	30.532	27.150
	63	Anon. $17^h 45^m 32^s$	. .	1	V	" " "	"	"	"	"	"	"	27.722	. .	27.190
	64	B. A. C. 6042 (2d *)	. .	2	VII, IX	" " "	"	"	"	"	"	"	28.663	. .	28.153
	65	ψ^2 Draconis	. .	3	IV-VI	346 45 7.9	4.8	17.6	5.8	12.5	6.5	9.18	34.425	30.532	33.884

Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
30.006	73.0	66.6	− 1 38.4	S. 0 48 24.0	0.8	+ 38 5 14.0	− 6.7	Y.	
. .	. .	. .	. .	. . . .	. .	. . . . .	. .	Y.	
30.027	77.5	73.3	+ 2 31.9	S. 77 22 34.6	4 2.7	− 38 32 58.5	+ 15.9	Y.	
. .	. .	. .	2 1.6	N. 29 32 54.3	31.6	+ 68 27 4.7	− 8.0	Y.	
30.022	77.0	73.0	+ 39.9	S. 63 55 40.6	1 53.2	− 25 3 55.0	+ 9.8	Y.	
. .	. .	. .	− 38.5	60 19 21.4	1 37.4	21 27 20.0	7.8	Y.	
. .	. .	. .	2.4	60 19 57.5	1 37.4	21 27 56.1	7.7	Y.	
. .	. .	. .	− 2 4.1	S. 57 42 55.5	1 27.9	− 18 50 44.6	+ 6.2	Y.	
. .	. .	. .	+ 43.4	N. 33 24 15.8	36.8	+ 72 18 31.4	− 9.3	Y.	
30.040	76.2	71.8	+ 2 54.5	N. 33 22 4.8	36.8	+ 72 16 20.4	− 9.3	Y.	
. .	. .	. .	− 4.3	S. 72 19 56.8	2 53.3	− 33 29 11.3	+ 6.2	Y.	
30.040	76.0	71.4	53.6	40 20 56.6	47.4	− 1 28 5.2	− 2.7	Y.	
. .	. .	. .	21.1	0 24 38.4	0.9	+ 38 28 59.5	9.4	Y.	
. .	. .	. .	2 27.7	1 57 37.2	1.9	36 55 59.7	9.6	Y.	
. .	. .	. .	4.1	2 0 0.9	1.9	+ 36 53 36.0	9.6	Y.	
. .	. .	. .	1 40.0	49 18 23.1	1 5.0	− 10 25 49.3	3.5	Y.	
. .	. .	. .	− 1 46.4	0 48 19.0	0.8	+ 38 5 19.0	10.3	Y.	
30.050	75.2	70.2	+ 1 52.3	47 56 53.4	1 2.0	− 9 4 17.6	5.3	Y.	
. .	. .	. .	+ 14.0	3 55 19.2	3.8	+ 34 58 15.8	10.8	Y.	
30.050	75.0	70.0	− 19.7	48 4 44.4	1 2.3	− 9 12 7.9	6.7	Y.	
. .	. .	. .	− 1 7.9	S. 2 8 53.4	2.1	+ 36 44 43.3	11.6	Y.	
. .	. .	. .	. .	. . . .	. .	. . . . .	. .	Y.	
30.020	78.5	74.7	+ 3 7.2	N. 37 36 50.9	42.7	+ 76 31 12.4	− 8.6	Y.	
. .	. .	. .	+ 50.3	S. 59 15 54.3	1 33.1	− 20 33 48.6	+ 7.0	Y.	
30.020	78.2	73.7	− 2 39.5	76 22 21.7	3 44.7	− 38 32 27.6	+ 11.5	Y.	
. .	. .	. .	− 1 54.7	S. 1 33 7.5	1.5	+ 37 20 29.8	− 8.0	Y.	
. .	. .	. .	+ 39.4	N. 33 24 13.9	36.7	72 18 28.4	9.8	Y.	
. .	. .	. .	1 15.6	33 23 38.6	36.7	72 17 56.5	9.8	Y.	
30.020	78.0	73.0	2 50.6	N. 33 22 3.7	36.7	+ 72 16 19.2	− 9.9	Y.	
. .	. .	. .	36.2	S. 72 15 36.0	2 52.0	− 33 24 49.2	+ 6.4	Y.	
. .	. .	. .	1 17.8	72 16 17.5	2 52.2	33 25 30.9	6.3	Y	
. .	. .	. .	+ 48.9	54 20 53.1	1 17.5	− 15 28 31.8	+ 0.3	Y.	
. .	. .	. .	− 22.9	0 24 41.0	0.4	+ 38 28 57.4	− 9.8	Y.	
. .	. .	. .	− 2 8.9	1 57 54.8	1.9	36 55 42.1	10.0	Y.	
. .	. .	. .	+ 31.4	2 0 35.2	2.0	+ 36 53 1.7	10.0	Y.	
30.026	76.8	71.7	− 1 37.3	49 18 26.2	1 4.8	− 10 25 52.2	3.6	Y.	
. .	. .	. .	1 35.3	0 48 24.6	0.8	+ 38 5 13.4	− 10.8	Y.	
30.030	76.5	70.6	1 1.8	76 48 59.0	3 53.7	− 37 59 13.9	+ 0.1	Y.	
. .	. .	. .	18.4	48 4 46.7	1 3.3	− 9 12 11.2	− 6.8	Y.	
30.030	76.0	69.2	1 6.9	2 8 54.4	2.1	+ 36 44 42.3	− 12.0	Y.	
. .	. .	. .	. .	. . . .	. .	. . . . .	. .	Y.	
30.040	79.5	76.5	− 1 34.0	25 58 30.4	27.0	12 54 41.4	+ 1.4	Y.	
. .	. .	. .	+ 1 20.2	24 21 19.2	25.1	+ 14 31 54.5	0.5	Y.	
30.036	79.2	76.0	− 9.8	67 9 52.1	2 10.6	− 28 18 23.9	13.4	Y.	
. .	. .	. .	+ 21.6	S. 57 0 22.2	1 25.2	− 18 8 8.6	+ 9.3	Y.	
30.044	79.0	75.0	+ 29.5	N. 29 39 30.5	31.6	+ 68 33 40.9	− 8.5	Y.	
. .	. .	. .	− 13.0	S. 30 9 53.9	32.3	+ 8 43 12.6	− 0.1	Y.	
. .	. .	. .	− 1 25.8	61 53 37.0	1 43.7	− 23 1 41.9	+ 8.7	Y.	
30.056	78.5	74.0	+ 52.7	59 15 54.3	1 33.3	20 23 48.8	7.0	Y.	
. .	. .	. .	1 6.4	65 31 5.2	2 1.5	− 26 39 27.9	+ 7.3	Y.	
. .	. .	. .	36.8	33 24 17.1	36.8	+ 72 18 32.7	− 10.0	Y.	
. .	. .	. .	1 5.9	33 23 48.0	36.8	72 18 3.6	10.0	Y.	
30.050	77.8	72.4	2 48.7	33 22 5.2	36.7	+ 72 16 20.7	10.0	Y.	
. .	. .	. .	1 55.3	47 16 55.9	1 0.4	− 8 24 17.5	− 0.5	Y.	
. .	. .	. .	+ 53.5	54 20 55.8	1 17.6	− 15 28 34.6	+ 0.3	Y.	
. .	. .	. .	− 25.6	0 24 40.3	0.4	+ 38 28 58.1	− 10.1	Y.	
. .	. .	. .	+ 2 11.8	1 57 11.0	1.9	+ 36 56 25.9	10.4	Y.	
. .	. .	. .	. .	. . . .	. .	. . . . .	. .	Y.	
30.082	76.5	72.3	− 1 55.2	71 58 8.2	2 49.7	− 33 7 19.1	3.7	Y.	
. .	. .	. .	1 24.9	64 8 37.2	1 54.6	25 16 53.0	6.4	Y.	
30.080	76.2	72.2	− 1 12.8	75 3 51.8	3 25.9	36 13 38.9	− 5.5	Y.	
. .	. .	. .	+ 1 29.3	73 36 31.9	3 9.4	34 46 2.5	+ 13.7	Y.	
. .	. .	. .	28.1	73 35 30.6	3 9.3	34 45 1.1	13.6	Y.	
29.994	70.8	65.0	+ 57.9	S. 73 36 0.5	3 9.4	− 34 45 31.1	+ 13.6	Y.	
. .	. .	64.4	− 2 1.7	N. 33 6 52.5	36.9	+ 72 1 8.2	− 10.6	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd
						° ′ ″	″	″	′	″	″	″	r.	r.	r.
1877. Sept. 3	1	Anon. $18^{h}\ 9^{m}\ 40^{s}$	9.0	2	III, V	77 30 2.1	1.0	10.2	1.1	7.1	1.3	3.80	35.141	30.532	34.6
	2	Anon. $18^{h}\ 11^{m}\ 19^{s}$	9.0	3	V-IX	" " "	"	"	"	"	"	"	35.132	. .	34.6
	3	Anon $18^{h}\ 21^{m}\ 16^{s}$	. .	3	III-VII	90 30 1.6	59.5	8.0	59.4	3.7	59.5	1.95	32.198	. .	31.67
	4	Anon. $18^{h}\ 25^{m}\ 20^{s}$	8.3	3	V-IX	95 40 6.5	6.9	13.9	6.6	10.5	5.0	8.23	28.180	. .	27.66
	5	Anon. $18^{h}\ 34^{m}\ 39^{s}$	. .	1	VI	346 40 1.9	58.3	11.1	58.0	6.1	1.9	2.88	29.303	. .	28.75
	6	Anon. $18^{h}\ 50^{m}\ (42^{s})$	9.0	3	III-VII	81 0 1.1	58.7	7.4	58.8	2.4	0.1	1.42	30.351	. .	29.82
	7	O. Arg. S. 19202	8.5	3	III-VII	88 35 2.8	0.9	8.7	0.1	4.6	1.0	3.02	29.546	. .	29.01
	8	Lacaille 8090	7.0	3	III-VII	94 5 3.5	0.8	9.4	1.5	5.9	0.9	3.67	35.445	. .	34.92
	9	Nadir	. .	.	. .	199 59 59.7	55.4	66.0	58.1	61.4	59.9	60.08	30.388	30.532	. .
21	10	η Sagittarii	. .	3	III-VII	95 40 5.0	4.1	11.5	3.1	11.7	6.1	6.92	34.534	30.562	33.97
	11	B. A. C. 6343	. .	3	III-VII	82 30 2.2	58.8	5.7	57.5	6.6	2.0	2.13	33.691	. .	33.13
	12	6 Aquilæ	5.0	3	III-VII	63 45 5.0	2.2	9.0	1.3	9.8	6.0	5.55	30.027	. .	29.46
	13	B. A. C. 6435	6.0	3	III-VII	96 25 0.0	0.1	6.3	57.0	6.2	0.8	1.73	35.803	. .	35.24
	14	O. Arg. S. 19202	9.0	3	III-VII	88 35 2.2	0.0	6.3	57.9	6.2	3.0	2.60	29.515	. .	28.95
	15	Weisse 345	. .	1	V	67 20 5.8	4.8	11.7	3.1	10.8	7.2	7.23	33.720	. .	33.15
	16	Anon. $19^{h}\ 17^{m}\ 13^{s}$	. .	3	III-VII	" " "	"	"	"	"	"	"	31.348	. .	30.78
	17	Anon. $19^{h}\ 31^{m}\ 0^{s}$	7.0	2	III, VII	69 9 59.1	57.9	7.4	56.9	4.0	2.1	1.57	35.602	. .	35.04
	18	Lacaille 8196	. .	2	VII, IX	96 40 2.2	0.5	7.6	59.4	6.7	2.8	3.20	31.873	. .	31.33
	19	Weisse 1208	. .	3	III-VII	67 53 3.1	1.3	8.9	1.0	8.9	5.2	4.73	27.070	. .	26.50
	20	Anon. $19^{h}\ 55^{m}\ 21^{s}$	8.0	1	V	23 55 6.0	5.8	12.2	4.8	12.2	7.1	8.02	29.525	. .	28.96
	21	Anon. $19^{h}\ 57^{m}\ 26^{s}$	7.0	3	V-IX	" " "	"	"	"	"	"	"	33.080	. .	32.50
	22	Lalande 38708	. .	3	V-IX	20 5 1.1	59.2	7.9	57.9	7.9	1.2	2.53	27.148	. .	26.56
	23	Anon. $20^{h}\ 15^{m}\ 4^{s}$	9.0	2	I, IX	22 10 4.0	3.1	9.8	1.4	10.2	4.7	5.53	33.051	. .	32.45
	24	B. A. C. 7006	8.0	3	III-VII	" " "	"	"	"	"	"	"	33.515	. .	32.94
	25	Lacaille 8513	. .	3	III-VII	95 5 5.0	4.6	12.6	3.8	11.4	6.2	9.27	32.973	. .	32.41
	26	Anon. $20^{h}\ 49^{m}\ 8^{s}$	8.5	3	III-VII	78 20 2.1	2.7	9.4	1.8	7.9	2.9	4.47	26.686	. .	26.12
	27	Anon. $20^{h}\ 57^{m}\ 36^{s}$	8.0	3	III-VII	21 45 1.2	0.3	7.2	0.0	8.2	3.1	3.33	35.185	. .	34.61
	28	Lacaille 8760	6.0	3	III-VII	98 10 3.7	4.1	9.1	1.6	9.3	4.2	5.33	31.473	. .	30.91
	29	Anon. $21^{h}\ 18^{m}\ 50^{s}$	9.5	3	V-IX	20 9 59.2	58.2	66.8	58.7	65.5	59.2	61.27	36.298	. .	35.71
	30	Anon. $21^{h}\ 28^{m}\ 38^{s}$	7.7	3	III-VII	20 55 3.2	1.4	9.7	3.6	10.2	3.1	5.20	32.055	. .	31.48
	31	72 Cygni	6.5	3	V-IX	20 55 3.2	1.4	9.7	3.6	10.2	3.1	5.20	32.183	. .	31.60
	32	Anon. $21^{h}\ 40^{m}\ 4^{s}$	9.0	3	III-VII	77 50 2.8	3.2	9.8	1.8	9.2	4.9	5.28	31.229	. .	30.67
	33	O. Arg. N. 23385	7.0	3	IV-VI	5 50 5.2	4.8	14.0	5.5	12.2	7.0	8.12	27.007	. .	26.44
	34	Anon. $22^{h}\ 15^{m}\ 1^{s}$	7.0	3	V-IX	93 55 0.8	0.5	7.6	0.0	7.1	1.0	2.83	27.486	. .	26.93
	35	Nadir	. .	.	. .	200 0 4.1	4.2	10.3	4.3	8.8	5.2	6.15	30.611	30.562	.
22	36	33 Sagittarii	. .	2	VII, IX	80 25 5.6	4.2	10.7	3.1	11.7	6.6	6.98	35.460	30.521	34.93
	37	B. A. C. 6499	5.5	3	III-VII	90 5 1.1	59.8	6.4	55.8	6.2	2.0	2.38	31.292	. .	30.77
	38	O. Arg. S. 19256	. .	3	III-VII	81 40 5.7	3.2	9.7	3.0	9.3	5.4	6.05	34.174	. .	33.65
	39	Weisse (2) 556	. .	2	III, V	22 0 1.5	1.3	8.2	0.5	7.8	3.9	3.87	33.268	. .	34.74
	40	Anon. $19^{h}\ 20^{m}\ 59^{s}$	. .	2	VII, IX	" " "	"	"	"	"	"	"	38.678	. .	38.13
	41	Anon. $19^{h}\ 31^{m}\ 0^{s}$	7.3	3	III-VII	69 10 3.8	2.3	10.2	3.4	10.2	5.6	5.92	35.701	. .	35.18
	42	Lacaille 8196	6.0	3	V-IX	96 40 4.0	3.5	11.2	3.3	10.0	5.5	6.25	31.951	. .	31.44
	43	Anon. $19^{h}\ 49^{m}\ 30^{s}$	7.8	3	III-VII	96 55 5.1	4.9	11.7	3.4	9.9	6.3	6.88	32.704	. .	32.19
	44	Anon. $19^{h}\ 55^{m}\ 21^{s}$	. .	3	V-IX	23 55 2.4	1.2	8.2	0.0	7.7	3.1	3.77	29.367	. .	28.81
	45	Anon. $19^{h}\ 56^{m}\ 47^{s}$	. .	2	VII, IX	" " "	"	"	"	"	"	"	32.866	. .	32.3
	46	Weisse (2) 189	9.0	3	III-VII	20 10 5.9	4.7	12.8	6.0	10.7	6.1	7.70	31.100	. .	30.57
	47	Anon. $20^{h}\ 15^{m}\ 9^{s}$	9.0	2	III, V	22 10 2.9	2.3	9.8	2.4	10.4	4.6	5.40	32.982	. .	32.45
	48	Anon. $20^{h}\ 15^{m}\ 15^{s}$	8.2	2	VII, IX	" " "	"	"	"	"	"	"	33.486	. .	32.9
	49	Anon. $20^{h}\ 16^{m}\ 55^{s}$	8.5	2	VII, IX	" " "	"	"	"	"	"	"	35.804	. .	35.
	50	Anon. $20^{h}\ 33^{m}\ 22^{s}$	9.0	3	V-IX	31 29 58.8	56.8	64.1	55.0	64.2	60.2	59.85	27.210	. .	26.6
	51	Anon. $20^{h}\ 44^{m}\ 35^{s}$	. .	2	III-V	20 5 0.8	59.3	8.2	59.0	6.4	0.7	2.40	33.882	. .	33.
	52	Weisse 1359	6.5	3	III-VII	72 55 2.9	1.1	9.0	1.1	7.6	2.4	4.02	34.911	. .	34.
	53	O. Arg. S. 21286	6.5	3	III-VII	88 10 4.9	2.8	10.1	2.0	8.4	4.2	5.40	34.823	. .	34.
	54	Anon. $21^{h}\ 18^{m}\ 57^{s}$	9.0	3	III-VII	20 50 1.2	1.2	8.1	59.9	7.8	13.4	5.27	33.135	. .	32.
	55	Lalande 42034	. .	3	III-VII	20 54 58.9	57.9	65.9	58.3	65.7	60.1	1.13	31.849	. .	31.
	56	72 Cygni	5.5	3	V-IX	" " "	"	"	"	"	"	"	31.950	. .	31.
	57	Anon. $21^{h}\ 40^{m}\ 4^{s}$	9.0	2	III, V	77 50 4.1	4.1	11.9	5.0	11.8	5.8	7.12	31.326	. .	30.
	58	O. Arg. N. 23385	. .	3	IV-VI	5 50 3.0	3.8	12.8	4.8	10.2	5.5	6.68	26.913	. .	26.
	59	Anon. $22^{h}\ 15^{m}\ 2^{s}$	7.3	3	III-VII	93 55 1.7	1.6	8.5	1.0	7.3	1.4	3.58	27.551	. .	27.
	60	26 Cephei	5.0	3	IV-VI	354 25 0.4	1.2	9.8	0.2	7.7	1.9	3.53	33.674	. .	33.
	61	Nadir	. .	.	. .	200 0 1.2	1.7	8.4	1.9	8.2	2.7	4.02	30.501	30.521	-
23	62	Lacaille 9747	7.2	3	III-VII	85 25 2.0	1.7	7.8	3.0	7.8	3.7	4.33	31.198	30.459	30
	63	Lalande 713	. .	3	III-VII	20 40 4.8	4.9	12.2	4.3	13.7	5.2	7.52	39.983	. .	39
	64	π Andromedæ	5.0	3	III-VII	25 50 6.2	6.9	13.2	4.4	14.0	7.3	8.67	29.583	. .	29
	65	18 Ceti	6.5	3	III-VII	72 25 2.6	3.6	9.5	2.4	9.5	5.0	5.43	31.176	30.459	30

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 2 24.5	S. 57 27 39.3	1 28.4	− 18 35 28.9	+ 6.0	Y.	
. .	. .	. .	2 24.4	57 27 39.4	1 28.5	18 35 29.1	5.9	Y.	
. .	. .	. .	− 52.4	70 29 9.5	2 38.3	31 38 9.0	9.3	Y.	
30.010	70.0	63.7	+ 1 13.2	S. 75 41 21.4	3 38.2	− 36 51 20.8	+ 10.6	Y.	
30.014	70.0	63.2	38.9	N. 33 19-18.2	37.3	+ 72 13 34.3	− 12.3	Y.	
. .	. .	. .	5.5	S. 61 0 7.0	1 42.0	− 22 8 10.2	+ 3.4	Y.	
. .	. .	. .	+ 30.7	68 35 33.8	2 23.8	29 44 18.8	4.4	Y.	
30.026	69.0	62.2	− 2 34.2	74 2 29.5	3 16.0	35 12 6.7	4.7	Y.	
. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
30.068	68.0	64.0	2 4.7	75 38 2.2	3 37.8	36 48 1.2	12.4	Y.	
30.066	67.5	62.9	− 1 38.2	62 28 23.9	1 48.7	23 36 33.8	+ 5.9	Y.	
. .	. .	. .	+ 16.7	43 45 22.3	54.5	4 52 38.0	− 1.4	Y.	
. .	. .	. .	− 2 44.5	76 22 17.3	3 50.4	37 32 28.9	+ 9.3	Y.	
30.076	66.8	61.1	+ 32.7	68 35 35.3	2 24.6	29 44 21.1	+ 5.0	Y.	
. .	. .	. .	− 1 39.0	47 18 28.3	1 1.9	8 25 51.4	− 3.3	Y.	
. .	. .	. .	24.7	47 19 42.6	1 2.0	8 27 5.8	3.4	Y.	
. .	. .	. .	2 38.1	49 7 23.5	1 6.1	10 14 50.8	− 4.1	Y.	
30.100	65.6	59.5	− 41.8	76 39 21.4	3 56.8	37 49 39.4	+ 4.5	Y.	
. .	. .	. .	+ 1 49.4	47 56 54.2	1 3.5	− 9 4 18.9	− 6.1	Y.	
. .	. .	. .	+ 32.5	3 55 40.5	3.9	+ 34 57 54.4	17.2	Y.	
. .	. .	. .	− 1 18.5	3 53 49.6	3.9	34 59 45.3	17.4	Y.	
. .	. .	. .	+ 1 47.5	0 6 50.1	0.1	38 46 48.6	18.4	Y.	
. .	. .	. .	− 1 16.9	2 8 48.6	2.2	36 44 48.0	18.7	Y.	
. .	. .	. .	1 32.3	2 8 33.2	2.1	+ 36 45 3.5	18.7	Y.	
30.106	64.5	58.3	− 1 15.8	75 3 51.5	3 32.0	− 36 13 44.7	2.3	Y.	
. .	. .	. .	+ 2 1.4	58 22 5.8	1 33.1	− 19 30 0.1	8.9	Y.	
. .	. .	. .	− 2 24.7	1 42 38.7	1.7	+ 37 10 58.4	20.9	Y.	
30.122	63.2	58.0	28.8	78 9 36.6	4 27.5	− 39 20 25.3	5.9	Y.	
. .	. .	. .	2 59.2	0 7 2.0	0.1	+ 38 46 36.7	22.0	Y.	
. .	. .	. .	46.6	0 51 18.6	0.9	37 59 19.3	22.3	Y.	
. .	. .	. .	50.3	0 54 14.9	0.9	+ 37 59 23.0	22.3	Y.	
30.136	63.2	58.5	− 21.0	S. 57 49 44.3	1 31.2	− 18 57 36.7	14.1	Y.	
. .	. .	. .	+ 1 51.6	N. 14 8 0.3	14.5	+ 53 1 53.6	23.5	Y.	
30.140	63.0	58.0	+ 1 35.9	S. 73 56 38.8	3 17.3	− 35 6 17.3	− 14.3	Y	
. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
30.248	65.2	60.0	− 2 35.1	60 22 31.8	1 40.9	21 30 33.9	+ 3.8	Y.	
. .	. .	. .	24.3	70 4 38.0	2 37.5	31 13 36.7	6.2	Y.	
30.248	65.0	59.2	1 54.6	61 38 11.4	1 46.4	− 22 46 19.0	+ 2.4	Y.	
. .	. .	. .	2 28.6	1 57 35.3	2.0	+ 36 56 1.5	− 15.3	Y.	
. .	. .	. .	4 14.9	1 55 49.0	1.9	+ 36 57 47.9	15.4	Y.	
. .	. .	. .	2 42.4	49 7 23.5	1 6.7	− 10 14 51.4	− 4.1	Y.	
30.250	64.0	57.6	45.3	76 39 20.9	3 58.9	37 49 41.0	+ 4.5	Y.	
. .	. .	. .	− 1 8.7	76 53 58.2	4 3.4	− 38 4 22.8	+ 3.1	Y.	
. .	. .	. .	+ 36.6	3 55 40.4	4.0	+ 34 57 54.4	− 17.4	Y.	
. .	. .	. .	− 1 12.8	3 53 51.0	3.9	34 59 43.9	17.5	Y.	
. .	. .	. .	17.9	0 9 49.8	0.2	38 43 48.8	18.6	Y.	
. .	. .	. .	1 17.0	2 8 48.4	2.2	36 44 48.2	18.8	Y.	
. .	. .	. .	1 32.2	2 8 33.2	2.2	36 45 3.4	18.9	Y.	
. .	. .	. .	− 2 44.8	2 7 20.6	2.2	36 46 16.0	19.0	Y.	
30.270	63.0	55.6	+ 1 44.1	11 31 44.0	11.9	- 27 21 42.9	18.5	Y.	
. .	. .	. .	− 1 45.1	0 3 17.2	0.1	+ 38 50 21.5	20.7	Y.	
. .	. .	. .	2 17.7	52 52 46.4	1 16.8	− 14 0 24.4	10.9	Y.	
. .	. .	. .	2 15.0	68 7 50.4	2 24.1	− 29 16 35.7	8.6	Y.	
. .	. .	. .	1 21.7	0 48 43.5	0.8	+ 38 4 54.5	22.2	Y.	
. .	. .	. .	41.4	0 54 19.7	0.9	37 59 18.2	22.5	Y.	
. .	. .	. .	44.3	0 54 16.9	0.9	+ 37 59 21.0	22.6	Y.	
30.262	62.5	53.5	− 25.7	S. 57 49 41.4	1 32.5	− 18 57 35.1	14.1	Y.	
. .	. .	. .	+ 1 53.2	N. 14 8 0.1	14.7	+ 53 1 53.6	23.8	Y.	
30.268	60.5	52.7	− 1 32.8	S. 73 53 30.7	3 19.6	− 35 3 11.5	14.2	Y.	
. .	. .	. .	1 38.6	N. 25 36 35.1	28.0	+ 64 30 41.9	23.4	Y.	
. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
30.256	63.5	56.2	23.3	S. 65 24 41.0	2 6.1	− 26 33 8.3	25.3	Y.	
. .	. .	. .	− 4 58.2	0 35 9.3	0.6	+ 38 18 28.9	24.2	Y.	
. .	. .	. .	+ 27.6	5 50 36.3	5.9	+ 33 2 56.6	24.7	Y.	
. .	. .	. .	− 22.5	S. 52 24 42.9	1 15.4	− 13 32 19.5	− 27.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	′	r.	r.	r.
1877. Sept. 23	1	Lalande 1504	8.5	3	V-IX	20 25 5.0	5.0	12.9	4.2	13.4	5.7	7.70	34.329	30.459	33.853
	2	O. Arg. N. 1118	. .	3	IV-VI	4 25 1.0	1.4	8.3	59.0	8.2	1.9	3.30	33.190	. .	32.727
	3	Weisse 0^h, 144	9.0	3	III-VII	46 0 0.4	59.8	5.8	58.0	6.4	1.0	1.90	33.913	. .	33.452
	4	44 Ceti	. .	3	III-VII	67 30 2.2	1.8	8.6	0.2	7 8	3.5	4.02	28.756	. .	28.298
	5	Lacaille 444	7.0	3	III-VII	83 40 1.0	1.8	7.1	1.8	7.8	2.9	3.73	31.567	. .	31.112
	6	Weisse 643	7.5	3	III-VII	68 10 3.8	4.0	11.2	4.0	11.3	6.1	6.73	32.269	. .	32.172
	7	Lalande 3390	7.5	3	III-VII	22 5 0.1	1.1	7.9	59.6	9.1	2.2	3.33	32.951	. .	32.485
	8	O. Arg. S. 1210	9.0	3	V-IX	77 30 0.0	1.5	6.8	59.8	7.4	1.0	2.75	28.329	. .	27.877
	9	20 Arietis	6.0	3	III-VII	33 40 2.4	4.4	9.0	3.5	9.8	4.5	5.60	30.000	. .	29.536
	10	ξ Arietis	6.0	1	V	48 50 5.2	6.5	11.8	6.8	13.4	7.2	8.48	31.683	. .	31.224
	11	B. A. C. 750	7.5	3	III-VII	" " "	"	"	"	"	"	"	36.045	. .	35.584
	12	Lalande 4903	7.5	3	III-VII	44 30 2.3	2.8	6.9	0.8	8.8	3.1	4.12	24.617	. .	24.156
	13	O. Arg. S. 1834	8.0	3	III-VII	84 0 0.5	0.8	6.6	1.2	6.1	1.4	2.77	33.517	. .	33.063
	14	Anon. 2^h 52^m 30^s	9.0	3	V-IX	44 10 1.1	1.6	6.9	0.2	6.2	2.0	3.00	29.628	. .	29.166
	15	Anon. 2^h 58^m 17^s	8.5	3	V-IX	21 45 1.4	1.6	7.5	1.1	8.2	2.8	3.77	27.599	. .	27.124
	16	Anon. 3^h 5^m 12^s	8.0	3	III-VII	20 25 3.1	3.3	11.6	4.2	11.3	4.0	6.25	34.835	. .	34.368
	17	Nadir	. .	.	. .	200 0 5.2	5.8	12.6	5.2	10.7	7.0	7.75	30.558	30.459	. .
25	18	B. A. C. 8252	7.0	3	IV-VI	6 25 1.6	59.8	8.5	58.5	8.2	4.1	3.45	30.110	30.465	29.641
	19	Lacaille 9747	. .	3	III-VII	85 25 2.9	0.9	9.5	2.0	9.2	5.2	4.95	31.145	. .	30.685
	20	Radcliffe 73	8.0	3	III-VII	14 40 6.0	2.0	11.1	0.9	10.7	6.0	6.12	34.459	. .	33.985
	21	Groombridge 73	9.0	3	III-VII	16 9 56.6	52.2	60.8	48.0	60.2	55.9	55.62	27.541	. .	27.067
	22	Weisse 749	9.0	3	V-IX	25 50 6.6	5.8	11.7	2.6	13.7	8.5	8.15	28.385	. .	27.906
	23	18 Ceti	. .	3	III-VII	72 25 4.0	4.1	10.0	2.7	12.2	7.2	6.70	31.123	. .	30.660
	24	Lalande 1504	. .	3	V-IX	20 24 58.4	55.8	64.0	51.2	65.9	59.1	59.07	34.126	. .	33.644
	25	64 Ceti	6.0	3	III-VII	70 55 4.3	2.0	8.9	0.0	10.2	6.9	5.38	31.329	. .	30.866
	26	O. Arg. N. 1118	. .	2	VI, VII	4 25 3.8	2.2	9.9	0.0	10.8	7.0	5.62	33.352	. .	32.874
	27	Weisse 144	. .	3	V-IX	46 0 3.6	2.2	9.5	0.0	11.1	6.0	5.40	34.067	. .	33.598
	28	44 Ceti	. .	3	III-VII	67 30 1.4	58.8	6.2	58.4	6.3	3.1	2.37	28.647	. .	28.183
	29	Lacaille 444	. .	3	III-VII	83 40 4.1	1.9	8.8	0.8	9.2	5.5	5.05	31.543	. .	31.082
	30	Weisse 643	. .	3	III-VII	68 10 3.7	1.9	9.8	0.9	10.3	7.1	5.62	32.583	. .	32.120
	31	Lalande 3390	. .	3	III-VII	22 5 2.0	1.0	7.7	59.2	9.2	4.9	4.00	33.010	. .	32.538
	32	O. Arg. S. 1210	9.0	3	III-VII	77 29 58.5	56.5	64.6	54.4	65.8	60.9	60.12	28.260	. .	27.798
	33	20 Arietis	6.0	3	III-VII	33 40 5.6	5.3	12.0	3.9	13.9	8.5	8.20	30.065	. .	29.595
	34	ξ Arietis	6.0	3	III-VII	48 50 3.6	2.8	9.0	2.2	11.3	7.8	6.12	31.607	. .	31.140
	35	B. A. C. 750	7.5	3	III-VII	" " "	"	"	"	"	"	"	35.954	. .	35.487
	36	Lalande 4903	. .	3	III-VII	44 30 0.9	58.1	5.1	55.4	6.1	1.7	1.22	24.519	. .	24.052
	37	O. Arg. S. 1834	8.5	3	III-VII	84 0 0.9	56.8	6.3	56.9	6.2	2.2	1.88	33.383	. .	32.923
	38	Anon. 2^h 52^m 30^s	9.5	3	V, IX	44 10 3.0	1.4	8.2	0.0	9.4	3.7	4.28	29.639	. .	29.168
	39	Anon. 2^h 58^m 17^s	8.5	3	V-IX	21 45 5.5	2.8	11.5	2.0	12.8	7.0	6.93	27.682	. .	27.201
	40	Anon. 3^h 6^m 11^s	8.5	3	III-VII	21 45 5.8	2.7	9.8	2.5	12.5	7.7	6.83	39.142	. .	38.670
	41	τ^4 Eridani	5.5	3	III-VII	81 4 58.7	56.8	63.4	54.0	62.3	59.9	59.18	32.717	. .	32.256
	42	Nadir	. .	.	. .	200 0 4.1	1.2	9.2	59.1	8.8	5.6	4.67	30.466	30.465	. .
Oct. 1	43	B. A. C. 6569	. .	3	III-VII	88 20 2.1	57.8	5.0	58.1	6.0	3.3	2.05	33.667	30.485	33.187
	44	Lacaille 8090	. .	3	III-VII	94 5 4.0	57.9	6.0	58.5	7.4	3.8	2.93	35.323	. .	34.845
	45	Lalande 36762	8.0	3	V-IX	22 0 0.2	55.4	4.1	54.0	5.2	2.0	0.15	37.226	. .	36.725
	46	Anon. 19^h 31^m 0^s	. .	3	III-VII	69 10 3.2	58.4	7.3	59.0	8.6	4.9	3.57	35.612	. .	35.129
	47	Lalande 37785	7.5	3	III-VII	23 55 6.1	1.2	10.1	0.4	11.3	6.5	5.93	34.287	. .	33.795
	48	Anon. 19^h 57^m 21^s	. .	1	V	23 55 1.0	56.5	5.0	55.9	5.4	0.0	0.75	30.402	. .	29.917
	49	Anon. 19^h 57^m 21^s	. .	2	III, VII	" " "	"	"	"	"	"	"	27.286	. .	26.791
	50	Anon. 19^h 57^m 26^s	7.5	3	V-IX	" " "	"	"	"	"	"	"	32.808	. .	32.308
	51	Weisse 135	8.0	2	III, VII	70 10 3.0	58.8	6.5	56.6	8.1	4.2	2.87	34.251	. .	33.769
	52	Anon. 20^h 34^m 7^s	8.5	3	V-IX	21 10 6.9	2.0	10.2	3.3	13.3	8.5	7.37	35.626	. .	35.125
	53	O. Arg. S. 20896	. .	3	III-VII	86 30 1.1	58.0	6.6	58.0	6.0	2.9	2.10	34.613	. .	34.133
	54	Weisse 1359	6.5	3	III-VII	72 55 4.9	1.0	8.1	59.5	9.9	5.5	4.82	34 911	. .	34.428
	55	Anon. 21^h 16^m 47^s	8.5	3	V-IX	70 0 2.4	59.8	7.1	57.9	8.1	5.3	3.43	32.494	. .	32.013
	56	Weisse (2) 871	7.3	2	III, V	24 45 2.2	57.4	4.9	55.9	5.4	1.4	1.20	28.335	. .	27.845
	57	Anon. 21^h 36^m 11^s	8.8	2	VII, IX	" " "	"	"	"	"	"	"	31.005	. .	30.499
	58	Weisse (2) 1102	5.5	3	III-VII	19 55 1.8	58.1	6.2	58.0	6.2	2.6	2.15	29.572	. .	29.079
	59	Lacaille 9012	. .	2	VII, IX	87 55 6.1	2.8	10.3	2.1	11.4	7.2	6.65	34.702	. .	34.234
	60	Piazzi 33	. .	3	III-VII	42 20 3.6	0.3	7.5	58.3	9.4	6.3	4.23	34.742	. .	34.254
	61	26 Cephei	. .	3	IV-VI	354 25 1.4	59.1	8.2	57.8	8.1	3.9	3.07	33.788	. .	33.297
	62	Nadir	. .	.	. .	200 0 3.3	0.0	7.5	0.2	8.8	4.0	3.07	30.464	30.485	. .
2	63	Lalande 36238	. .	3	III-VII	22 40 2.5	57.9	4.4	54.2	7.8	3.1	1.65	29.572	30.535	29.030
	64	Anon. 19^h 20^m 17^s	. .	2	III, VII	22 0 1.5	57.2	5.7	54.0	7.8	3 0	1.53	30.936	. .	30.390
	65	Lalande 36732	. .	2	VII, IX	" " "	"	"	"	"	"	"	37.337	30.535	36.778

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 2 0.7	S. 0 23 7.0	0.4	+ 38 30 31.4	− 23.6	Y.	
30.250	61.8	54.3	1 25.5	N. 15 36 22.2	16.3	54 30 17.3	20.6	Y.	
. .	. .	. .	− 1 48.2	S. 25 58 13.7	28.4	+ 12 54 56.7	26.5	Y.	
30.240	61.2	54.2	+ 53.4	47 30 57.4	1 3.6	− 8 38 22.2	28.7	Y,	
. .	. .	. .	− 34.8	63 39 28.9	1 57.0	24 47 47.1	30.0	Y.	
. .	. .	. .	1 8.1	48 8 58.7	1 4.9	− 9 16 24.8	29.1	Y.	
. .	. .	. .	− 1 17.9	2 3 45.4	2.1	+ 36 49 51.3	21.6	Y.	
. .	. .	. .	+ 1 6.5	57 31 9.2	1 31.3	− 18 39 1.7	30.2	Y.	
30.232	60.5	53.7	+ 14.5	13 40 20.1	14.2	+ 25 13 4.5	23.0	Y.	
. .	. .	. .	− 38.3	28 49 30.1	32.1	10 3 36.6	25 8	Y.	
. .	. .	. .	− 2 55.0	28 47 13.4	32.0	10 5 53.4	25.8	Y.	
. .	. .	. .	+ 3 3.1	24 33 7.3	26.6	+ 14 20 4.9	24.5	Y.	
. .	. .	. .	− 1 36.0	63 58 26.8	1 58.7	− 25 6 46.7	31.5	Y.	
. .	. .	. .	+ 26.1	24 10 29.1	26.1	+ 14 42 43.6	23.6	Y.	
. .	. .	. .	+ 1 30.1	1 46 33.9	1.8	37 7 3.1	17.4	Y.	
. .	. .	. .	− 2 16.9	S. 0 22 49.3	0.4	38 30 49.1	16.7	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	+ 11.2	N. 13 34 45.3	13.8	+ 52 28 37.9	24.5	Y.	
30.180	67.0	62.7	− 21.5	S. 65 24 43.5	2 4.2	− 26 33 8.9	25.2	Y.	
. .	. .	. .	− 2 4.9	N. 5 21 58.8	5.4	+ 44 15 43.0	24.4	Y.	
. .	. .	. .	+ 1 31.9	N. 3 48 32.5	3.8	42 42 15.1	24.3	Y.	
. .	. .	. .	+ 1 5.6	S. 5 51 13.8	5.9	+ 33 2 19.1	25.2	Y.	
30.174	67.0	62.2	− 20.7	52 24 46.0	1 14.1	− 13 32 21.3	27.7	Y.	
. .	. .	. .	1 54.2	0 23 4.9	0.4	+ 38 30 33.5	24.1	Y.	
. .	. .	. .	27.1	S. 50 54 38.3	1 0.3	− 12 2 9.8	28.2	Y.	
. .	. .	. .	1 30.1	N. 15 36 24.4	16.0	+ 54 30 19.2	21.3	Y.	
30.164	66.5	61.6	− 1 52.8	S. 25 58 12.6	27.9	+ 12 54 58.3	26.7	Y.	
. .	. .	. .	+ 56.9	47 30 59.3	1 2.4	− 8 38 22.9	28.7	Y.	
. .	. .	61.6	− 33.9	63 39 31.1	1 55.0	24 47 47.3	29.8	Y.	
30.164	66.3	61.6	1 6.4	48 8 59.2	1 3.8	− 9 16 24.2	29.1	Y.	
. .	. .	. .	− 1 19.6	2 3 44.4	2.1	+ 36 49 52.3	22.1	Y.	
. .	. .	. .	+ 1 9.0	57 31 9.1	1 29.7	− 18 39 0.0	30.2	Y.	
. .	. .	. .	+ 12.7	13 40 20.9	13.9	+ 25 13 4.0	23.4	Y.	
. .	. .	. .	− 35.7	28 49 30.4	31.5	10 3 36.9	26.0	Y.	
30.160	65.5	60.6	− 2 52.0	28 47 14.2	31.5	10 5 53.1	26.0	Y.	
. .	. .	. .	+ 3 6.4	24 33 7.6	26.2	+ 14 20 5.0	24.7	Y.	
30.150	65.2	60.1	− 1 31.6	63 58 30.3	1 56.9	− 25 6 48.4	31.4	Y.	
. .	. .	. .	+ 26.1	24 10 30.3	25.8	+ 14 42 42.7	23.8	Y.	
. .	. .	. .	+ 1 27.7	1 46 34.6	1.8	37 7 2.4	17.9	Y.	
. .	. .	. .	− 4 31.7	1 40 35.1	1.7	+ 37 13 2.0	17.3	Y.	
30.148	65.0	59.9	− 1 10.7	61 3 48.5	1 43.4	− 22 11 53.1	− 30.8	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.150	71.0	67.6	− 1 39.9	68 18 22.2	2 21.0	29 27 4.4	+ 5.0	Y.	
. .	. .	. .	2 31.9	74 2 31.1	3 14.8	− 35 12 7.1	+ 6.2	Y.	
. .	. .	. .	3 30.7	1 56 29.4	1.9	+ 36 57 7.5	− 15.8	Y.	
30.154	70.8	66.5	2 40.7	49 7 22.8	1 5.3	− 10 14 49.3	3.9	Y.	
. .	. .	. .	− 1 58.9	3 53 7.0	3.9	+ 35 0 27.9	17.3	Y.	
. .	. .	. .	+ 2.6	3 55 3.3	3.9	34 58 31.6	18.3	Y.	
. .	. .	. .	+ 1 40.6	3 56 41.3	3.9	34 56 53.6	18.3	Y.	
. .	. .	. .	− 1 12.3	3 53 48.4	3.9	+ 34 59 46.5	18.3	Y.	
30.146	70.0	65.2	1 58.1	50 8 4.7	1 7.9	− 11 15 33.8	7.0	Y.	
. .	. .	. .	2 40.6	1 7 26.8	1.1	+ 37 46 10.9	21.2	Y.	
30.154	68.5	63.7	2 9.5	66 27 52.6	2 10.0	− 27 36 23.8	5.3	Y.	
. .	. .	. .	2 18.8	52 52 46.0	1 15.2	14 0 22.4	10.4	Y.	
30.148	68.0	62.5	− 1 3.1	49 59 0.3	1 7.9	− 11 6 29.4	13.4	Y.	
. .	. .	. .	+ 1 7.5	4 46 8.7	4.8	+ 34 7 25.3	24.0	Y.	
. .	. .	. .	− 15.6	S. 4 44 45.6	4.7	34 8 48.5	24.0	Y.	
. .	. .	. .	+ 28.8	N. 0 4 29.0	0.1	+ 38 58 7.9	24.9	Y.	
30.150	66.5	61.1	− 2 12.7	S. 67 52 54.0	2 19.9	− 29 1 35.1	12.5	Y.	
. .	. .	. .	2 13.3	S. 22 17 50.9	23.5	+ 16 35 24.4	23.1	Y.	
30.150	66.0	60.7	− 1 43.3	N. 25 36 40.3	27.5	64 30 46.6	26.1	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.050	71.0	69.0	+ 30.4	S. 2 40 32.1	2.6	36 13 4.1	14.9	Y.	
. .	. .	. .	− 12.2	1 59 49.3	2.0	36 53 47.5	15.9	Y.	
. .	. .	. .	− 3 32.4	S. 1 56 29.1	1.9	+ 36 57 7.8	− 15.9	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.									MICROMETER.		
						A.			B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
1877.						°	′	″	″	″	″	″	″	″	r.	r.	r.
Oct. 2	1	O. Arg. S. 19857 . .	. .	3	III-VII	75	25	5.8	1.3	11.8	2.1	12.2	7.8	6.83	28.654	30.535	28.122
	2	Anon. 19^h 49^m 30^s .	. .	3	III-VII	96	55	5.4	3.3	10.6	1.2	11.2	7.2	6.48	32.448	. .	31.921
	3	B. A. C. 6857. . .	. .	2	V, IX	18	50	2.2	57.3	7.2	55.2	8.1	2.8	2.18	28.656	. .	28.101
	4	Weisse (2) 412 . .	. .	2	VII, IX	22	10	3.8	0.8	9.0	57.6	11.2	6.7	4.85	25.732	. .	25.174
	5	Anon. 20^h 15^m 12^s .	. .	1	III	"	"	"	"	"	"	"	"	"	33.035	. .	32.464
	6	B. A. C. 7006. . .	. .	1	V	"	"	"	"	"	"	"	"	"	33.544	. .	33.009
	7	Anon. 20^h 32^m 24^s .	. .	3	III-VII	31	30	6.7	3.0	10.1	0.2	12.7	9.1	6.97	27.615	. .	27.075
	8	O. Arg. S. 20819 . .	. .	3	V-IX	83	5	3.8	0.1	7.6	57.4	8.1	4.3	3.55	36.583	. .	36.062
	9	Anon. 20^h 57^m 36^s .	7.7	3	III-VII	21	45	4.0	59.8	7.1	57.4	10.1	5.0	3.90	35.268	. .	34.726
	10	Anon. 21^h 4^m 10^s .	8.0	3	III-VII	71	10	4.8	59.8	7.9	59.9	9.8	6.6	4.80	38.372	. .	37.839
	11	Anon. 21^h 5^m 50^s .	8.0	3	V-IX	"	"	"	"	"	"	"	"	"	34.536	. .	34.008
	12	Weisse (2) 871 . .	7.0	3	III-VII	24	45	4.8	0.5	8.6	59.8	9.2	5.6	4.75	28.483	. .	27.942
	13	Weisse (2) 1100 . .	. .	3	III-VII	19	55	3.0	59.1	7.8	59.1	9.2	4.1	3.72	38.082	. .	37.539
	14	30 Aquarii	. .	3	III-VII	66	0	4.1	57.3	7.2	58.2	8.7	4.7	3.37	31.929	. .	31.395
	15	Piazzi 33	6.0	3	III-VII	42	20	3.9	59.5	7.0	57.8	8.8	5.2	3.70	34.724	. .	34.186
	16	Anon. 22^h 17^m 31^s .	. .	3	III-VII	22	10	0.2	55.5	4.8	53.2	5.7	1.3	0.12	35.355	. .	34.813
	17	Anon. 22^h 38^m 29^s .	8.5	3	III-VII	73	10	1.8	57.0	5.9	57.0	6.5	2.0	1.70	32.471	. .	31.938
	18	Lacaille 9315 (1st *)	8.8	3	III-VII	85	40	3.8	59.3	9.1	58.8	8.8	3.7	3.92	29.334	. .	28.804
	19	Nadir	. .	.	. .	200	0	0.0	55.8	4.1	55.3	5.2	1.6	0.33	30.398	30.535	. .
5	20	Lacaille 8045. . .	. .	3	V-IX	92	40	0.2	0.0	6.1	58.7	4.6	0.1	1.62	39.716	30.504	39.233
	21	Lalande 36732 . .	. .	3	IV-VI	22	0	4.9	4.9	11.5	5.0	12.4	6.1	7.47	37.395	. .	36.889
	22	O. Arg. S. 19857 . .	8.8	2	III, VII	75	25	0.7	59.5	8.1	0.8	6.1	0.2	2.57	28.564	. .	28.064
	23	ϵ^1 Sagittarii	7.5	2	V, IX	"	"	"	"	"	"	"	"	"	24.474	. .	26.977
	24	Weisse 1068 . . .	7.5	3	III-VII	73	5	3.6	2.4	9.8	3.0	9.4	3.3	5.25	28.356	. .	27.854
	25	Anon. 19^h 59^m 20^s .	. .	3	III-VII	28	0	5.4	5.2	12.2	7.0	12.8	7.0	8.27	31.786	. .	31.276
	26	ξ^2 Capricorni . . .	. .	1	IX	71	55	7.2	8.2	14.9	7.8	13.9	9.0	10.17	38.716	. .	38.222
	27	Anon. 20^h 19^m 53^s .	8.3	2	V, VI	351	35	3.8	3.1	12.5	. .	9.5	3.9	5.80	29.178	. .	28.669
	28	Anon. 20^h 32^m 24^s .	. .	3	V-IX	31	30	1.3	0.3	7.9	0.1	7.4	0.9	2.98	27.543	. .	27.028
	29	Anon. 20^h 38^m 38^s .	7.5	3	III-VII	80	9	59.1	60.8	68.4	61.0	66.6	60.9	62.80	31.322	. .	30.822
	30	O. Arg. S. 20896 . .	. .	3	V-IX	86	30	5.8	8.2	14.0	8.2	14.0	6.5	9.45	34.970	. .	34.477
	31	Anon. 20^h 57^m 36^s .	7.7	3	III-VII	21	45	2.0	1.5	8.9	0.9	8.8	2.5	4.10	35.248	. .	34.737
	32	Lacaille 8760. . .	6.5	3	III-VII	98	10	2.9	3.9	10.1	4.0	9.3	3.6	5.63	31.560	. .	31.064
	33	Anon. 21^h 36^m 11^s .	9.0	3	III-VII	24	45	5.9	6.2	14.0	6.0	11.0	4.9	8.00	31.479	. .	30.969
	34	Weisse (2) 1102 . .	6.0	3	III-VII	19	55	0.2	1.8	8.9	1.8	7.7	0.0	3.40	29.604	. .	29.092
	35	30 Aquarii	5.5	3	V-IX	66	0	2.3	2.1	9.7	1.5	8.5	2.1	4.37	32.028	. .	31.527
	36	Anon. 22^h 4^m 50^s .	6.5	3	IV-VI	347	10	4.7	4.0	15.6	5.2	10.8	4.4	7.45	35.210	. .	34.697
	37	Anon. 22^h 17^m 31^s .	. .	3	III-VII	22	10	4.2	6.2	12.9	7.6	11.4	5.5	7.97	35.403	. .	34.892
	38	Lacaille 9195. . .	7.5	3	III-VII	85	10	4.0	5.8	13.7	7.6	11.4	5.9	8.07	32.945	. .	32.447
	39	Anon. 22^h 37^m 38^s .	8.3	3	III-VII	73	10	4.4	7.1	12.2	9.3	11.2	6.0	8.37	32.752	. .	32.250
	40	Lacaille 9315 (1st *).	. .	3	III-VII	85	40	5.6	7.1	13.7	9.9	12.4	6.0	9.12	29.586	. .	29.087
	41	Anon. 23^h 11^m 37^s .	. .	2	VII, IX	65	4	59.8	58.9	66.8	61.4	65.5	58.1	61.75	32.894	. .	32.393
	42	Anon. 23^h 20^m 29^s .	. .	3	IV-VI	352	40	1.1	2.2	10.8	2.8	5.2	58.9	3.50	32.478	. .	31.967
	43	Nadir	. .	.	. .	200	0	4.1	4.3	11.3	6.2	8.6	4.4	6.48	30.564	30.504	. .
13	44	Anon. 19^h 49^m 42^s .	. .	2	VII, IX	96	50	1.7	1.6	7.8	0.7	9.5	3.1	4.07	32.498	30.403	32.120
	45	Anon. 19^h 57^m 21^s .	. .	3	V-IX	23	55	4.1	3.6	9.1	1.2	10.2	4.1	5.38	30.435	. .	30.017
	46	Anon. 20^h 13^m 27^s .	7.3	3	III-VII	92	0	3.1	2.4	9.0	1.2	9.3	3.1	4.68	34.116	. .	33.719
	47	Lacaille 8471. . .	6.5	3	III-VII	100	45	5.	2.8	8.2	2.8	10.1	5.1	5.75	32.433	. .	32.039
	48	Anon. 20^h 34^m 7^s .	. .	3	III-VII	21	5	6.2	6.1	11.8	5.2	13.5	7.2	8.33	26.096	. .	25.686
	49	Anon. 20^h 44^m 35^s .	. .	3	III-VII	20	5	6.3	5.3	11.8	5.0	14.7	7.3	8.40	34.057	. .	33.646
	50	Weisse 1359 . . .	6.3	3	III-VII	72	55	0.8	0.2	6.8	0.9	7.8	2.3	3.13	34.758	. .	34.357
	51	Anon. 21^h 4^m 10^s .	7.5	3	I-V	71	5	3.8	3.3	8.4	2.2	10.2	6.0	5.65	28.784	. .	28.386
	52	Anon. 21^h 20^m 42^s .	8.0	3	III-VII	"	"	"	"	"	"	"	"	"	25.024	. .	24.623
	53	Lacaille 8873. . .	6.0	3	III-VII	93	54	58.0	56.2	62.5	53.8	63.8	57.4	58.62	29.604	. .	29.208
	54	Weisse (2) 1100 . .	7.7	3	III-VII	19	50	5.5	6.2	11.3	5.2	13.4	7.0	8.10	28.599	. .	28.188
	55	Anon. 22^h 4^m 50^s .	. .	3	IV-VI	347	10	4.7	2.9	10.9	4.2	12.6	6.4	6.95	35.182	. .	34.770
	56	B. A. C. 7810 . .	. .	3	IV-VI	352	49	56.0	56.4	63.7	57.8	63.3	57.7	59.15	33.141	. .	32.731
	57	Anon. 22^h 30^m 36^s .	7.0	3	III-VII	72	35	5.0	6.0	11.7	4.9	12.9	6.8	7.88	32.310	. .	31.909
	58	Anon. 22^h 38^m 14^s .	. .	2	VII, IX	73	10	3.2	3.7	9.8	4.9	11.4	5.0	6.33	35.836	. .	35.435
	59	Anon. 22^h 49^m 38^s .	8.0	2	VII, IX	85	44	58.7	57.8	64.4	58.3	65.3	59.1	60.60	33.900	. .	33.509
	60	h^4 Aquarii	. .	3	III-VII	67	15	1.1	1.8	8.1	0.2	7.2	3.9	3.72	33.095	. .	32.693
	61	Anon. 23^h 11^m 37^s .	8.0	3	III-VII	65	5	0.7	58.9	5.4	58.9	6.2	1.2	1.88	33.135	. .	32.733
	62	Anon. 23^h 20^m 39^s .	. .	3	IV-VI	352	40	5.2	5.8	13.1	5.0	12.7	4.7	7.75	32.709	. .	32.299
	63	75 Pegasi	5.5	3	III-VII	41	10	4.1	3.8	9.2	4.8	9.8	8.0	6.62	31.341	. .	30.935
	64	Anon. 23^h 41^m 35^s .	. .	3	IV-VI	355	25	0.0	0.4	6.4	0.3	5.6	0.0	2.12	28.696	. .	28.287
	65	B. A. C. 8355 (1st *).	. .	3	IV-VI	353	30	2.2	2.4	9.6	1.4	8.2	2.4	4.37	32.830	30.403	32.421

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
30.056	71.0	68.2	+ 58.8	S. 55 26 5.7	1 21.5	− 16 33 48.4	− 2.0	Y.	
. .	. .	. .	− 1 0.2	S. 76 54 6.3	3 56.7	− 38 4 24.2	+ 3.9	Y.	
. .	. .	. .	+ 59.5	N. 1 8 58.3	1.1	+ 40 2 38.2	− 18.9	Y.	
. .	. .	. .	+ 2 31.2	S. 2 12 36.1	2.2	36 41 0.5	19.7	Y.	
. .	. .	. .	− 1 17.2	2 8 47.6	2.1	36 44 49.1	19.9	Y.	
. .	. .	. .	− 1 34.3	2 8 30.6	2.1	36 45 6.1	20.0	Y.	
30.068	70.5	66.5	+ 1 31.7	11 31 38.6	11.5	+ 27 21 48.7	19.4	Y.	
. .	. .	. .	− 3 10.0	63 1 53 6	1 50.5	− 24 10 5.3	5.8	Y.	
. .	. .	. .	2 28.1	1 42 35.8	1.7	+ 37 11 1.3	22.6	Y.	
. .	. .	. .	4 5.6	51 5 59.2	1 10.0	− 12 13 30.4	11.9	Y.	
30.062	70.0	65.5	− 2 5.6	51 7 59.2	1 10.1	− 12 15 30.5	12.0	Y.	
. .	. .	. .	+ 1 4.5	S. 4 46 9.2	4.7	+ 34 7 24.9	24.2	Y.	
. .	. .	. .	− 3 56.2	N. 0 8 52.5	0.1	+ 39 2 31.4	25.1	Y.	
30.054	68.5	63.5	43.7	S. 45 59 19.6	58.7	− 7 6 39.5	17.8	Y.	
. .	. .	. .	2 11.2	22 17 52.5	23.3	+ 16 35 23.0	23.2	Y.	
. .	. .	. .	2 30.8	2 7 29.3	2.1	+ 36 46 7.4	25.9	Y.	
. .	. .	. .	− 1 0.7	53 9 1.0	1 15.7	− 14 16 37.9	19.5	Y.	
30.052	67.2	62.3	+ 37.5	65 40 41.4	2 5.2	26 49 7.8	− 18.1	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.040	63.5	55.0	− 4 49.3	72 35 12.3	3 1.9	− 33 44 35.4	+ 6.4	Y.	
. .	. .	. .	− 3 35.9	1 56 31.6	2.0	+ 36 57 5.2	− 16.1	Y.	
. .	. .	. .	+ 1 0.7	55 26 3 3	1 23.8	− 16 33 48.3	2.0	Y.	
30.044	63.0	53.6	1 34.7	55 26 37.3	1 23.9	16 34 22.4	2.0	Y.	
. .	. .	. .	+ 1 9.9	53 6 15.2	1 17.1	− 14 13 53.5	3.8	Y.	
. .	. .	. .	− 40.0	7 59 28.3	8.1	+ 30 54 2.4	18.1	Y.	
30.060	62.0	52.3	− 4 17.6	S. 51 50 52.5	1 13.8	− 12 58 27.5	6.2	Y.	
. .	. .	. .	+ 41.7	N. 25 24 12.5	27.6	+ 64 18 18.9	23.1	Y.	
. .	. .	. .	+ 1 33.1	S. 11 31 36.1	11.9	+ 27 21 50.8	19.8	Y.	
. .	. .	. .	− 25.7	60 9 37.0	1 41.0	− 21 17 39.2	6.6	Y.	
30.080	61.0	51.6	2 20.3	66 27 49.1	2 12.8	− 27 36 23.1	5.5	Y.	
. .	. .	. .	2 28.4	1 42 35.7	1.8	+ 37 11 1.3	23.1	Y.	
30.088	60.5	51.3	33.3	78 9 32 3	4 30.9	− 39 20 24.4	4.2	Y.	
. .	. .	. .	− 30.4	S. 4 44 37.6	4.8	+ 34 8 56.4	24.7	Y.	
. .	. .	. .	+ 28.4	N. 0 4 28.2	0.1	+ 38 58 7.1	25.7	Y.	
30.100	59.5	49 4	− 47.8	S. 45 59 16.5	1 0.5	− 7 6 38.2	17.9	Y.	
. .	. .	. .	2 27.2	N. 32 52 19.7	37.8	+ 71 46 36.3	26.8	Y.	
. .	. .	. .	2 33.3	S. 2 7 31.7	2.2	+ 36 46 1.9	26.6	Y.	
. .	. .	. .	1 16.7	65 8 51.3	2 5.8	− 26 17 18.3	16.2	Y.	
30.106	59.0	48.8	− 1 10.5	53 8 57.9	1 18.0	14 16 37.1	19.4	Y.	
. .	. .	. .	+ 28.6	65 40 37.7	2 8.9	26 49 7.8	17.9	Y.	
. .	. .	. .	− 1 15.0	S. 45 3 46.7	58.7	− 6 11 6.6	23.3	Y.	
30.120	58.5	48.4	1 1.7	N. 27 20 58.2	30.3	+ 66 15 7.3	− 27.0	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.190	59.2	54.4	1 6.4	S. 76 48 57.7	4 3.0	− 37 59 21.9	+ 4.4	Y.	
. .	. .	. .	0.5	3 55 4.9	4.0	+ 34 58 29.9	− 19.0	Y.	
. .	. .	. .	1 56.6	71 58 8.1	2 57.0	− 33 7 26.3	+ 0.4	Y.	
30.192	58.5	53.0	− 1 3.9	80 44 1.8	5 43.0	− 41 56 6.0	+ 2.2	Y.	
. .	. .	. .	+ 2 15.2	1 7 23.5	1.1	+ 37 46 14.2	− 22.4	Y.	
. .	. .	. .	− 1 54.3	0 3 14.1	0.1	+ 38 50 24.6	23.3	Y.	
30.200	57.5	51.8	− 2 16.6	52 52 46.6	1 17.1	− 14 0 24.9	10.0	Y.	
. .	. .	. .	+ 50.6	51 5 56.2	1 12.4	12 13 29.8	11.5	Y.	
. .	. .	. .	2 48.5	51 7 54.2	1 12.5	12 15 27.9	13.0	Y.	
30.210	56.5	50.3	24.8	S. 73 55 23.4	3 20.6	− 35 5 5.2	6.9	Y.	
. .	. .	. .	+ 56.8	N. 0 8 55.1	0.2	+ 39 2 34.1	26.9	Y.	
30.210	56.0	49.7	− 2 29.5	32 52 22.5	37.9	71 46 39.2	28.9	Y.	
. .	. .	. .	1 25.6	N. 27 11 26.4	30.2	+ 66 5 35.4	29.4	Y.	
. .	. .	. .	59.8	S. 52 34 8.0	1 16.5	− 13 41 45.7	18.4	Y.	
30.210	55.0	49.5	2 50.4	53 7 15.9	1 18.2	14 14 55.3	18.9	Y.	
. .	. .	. .	1 50 0	65 43 10.6	2 9.6	26 51 41.4	16.6	Y.	
. .	. .	. .	1 24.4	47 13 39.3	1 3.5	8 21 4.0	21.9	Y.	
30.216	55.0	48.9	1 25.7	S. 45 3 36.2	58.9	− 6 10 56.3	23.0	Y.	
. .	. .	. .	1 12.1	N. 27 21 4.3	30.4	+ 66 15 13.5	29.5	Y.	
. .	. .	. .	− 29.3	S. 21 9 37.3	22.8	17 43 38.7	27.7	Y.	
30.210	54.2	48.3	+ 53.7	N. 24 34 4.2	26.9	63 28 9.9	29.2	Y.	
30.210	54.0	48.1	− 1 15.9	N. 26 31 11.5	29.4	+ 65 25 19.7	− 28.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd	Nadir cor.	Corr'd.
1877.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
Oct. 13	1	B. A. C. 8355 (2d *)	. .	2	III, VII	353 30 2.2	2.4	9.6	1.4	8.2	2.4	4.37	32.988	30.403	32.553
	2	Nadir	. .	.	. .	200 0 0.0	0.7	5.5	58.3	5.4	0.8	1.78	30.312	30.403	. .
14	3	Anon. $2^h\ 9^m\ 36^s$	. .	2	V, VII	3 0 1.1	2.2	8.2	58.2	10.2	3.3	3.87	32.456	30.482	31.937
	4	O. Arg. S. 1554	8.0	3	III–VII	83 15 1.4	0.0	5.8	57.6	8.1	2.0	2.48	30.274	. .	29.796
	5	Weisse (2) 711	. .	3	III–VII	33 15 2.0	3.2	7.1	59.5	10.5	5.2	6.25	35.023	. .	34.536
	6	Weisse (2) 915	5.5	3	III–VII	23 25 0.9	59.8	5.7	57.0	8.9	2.5	2.47	30.027	. .	29.538
	7	B. A. C. 918	6.0	3	III–VII	81 45 2.1	1.9	7.6	0.0	9.5	3.9	4.17	32.583	. .	32.105
	8	Anon. $2^h\ 54^m\ 12^s$	6.5	3	V–IX	20 30 5.0	5.1	11.1	2.9	14.2	6.0	7.38	30.935	. .	30.428
	9	Anon. $3^h\ 5^m\ 16^s$	7.0	2	IV, VI	20 24 59.2	58.9	65.2	57.8	68.0	60.0	61.52	34.740	. .	34.247
	10	Anon. $3^h\ 5^m\ 34^s$	8.0	2	I, IX	“ “ “	“	“	“	“	“	“	34.272	. .	33.771
	11	Weisse 240	. .	3	III–VII	62 25 3.1	3.1	7.2	1.2	9.4	3.9	4.65	29.566	. .	29.085
	12	Anon. $3^h\ 28^m\ 35^s$	. .	2	IV, VI	12 0 2.9	4.7	11.0	3.0	13.2	5.8	6.77	26.160	. .	25.673
	13	Anon. $3^h\ 40^m$	8.0	3	III–VII	34 55 3.0	3.8	7.9	1.4	10.4	4.8	5.22	27.350	. .	27.848
	14	A 27 Pleiadum	5.5	3	III–VII	“ “ “	“	“	“	“	“	“	28.334	. .	26.864
	15	Weisse (2) 1143	. .	3	III–VII	23 50 0.4	0.9	5.2	59.0	8.7	1.7	2.65	30.497	. .	30.008
	16	Lacaille 1346	7.0	2	V, IX	90 15 2.8	2.9	7.7	59.7	8.2	3.4	4.12	33.370	. .	32.911
	17	Anon. $4^h\ 11^m\ 33^s$	8.3	3	III–VII	41 20 1.1	3.1	7.2	59.1	9.3	4.9	4.12	25.889	. .	25.404
	18	Anon. $4^h\ 18^m\ 17^s$	8.0	3	III–VII	84 30 1.5	2.5	7.7	0.8	9.1	4.8	4.40	27.653	. .	27.176
	19	B. A. C. 1404	7.0	3	III–VII	89 35 4.7	5.1	10.3	4.4	11.6	6.2	7.05	33.936	. .	33.460
	20	Anon. $4^h\ 35^m\ 38^s$	. .	3	V–IX	84 50 0.0	1.2	5.7	0.1	7.8	3.6	3.07	26.925	. .	26.453
	21	Anon. $4^h\ 41^m\ 42^s$	. .	2	VII, IX	48 10 6.0	6.4	11.7	5.9	15.5	8.6	9.02	30.545	. .	30.057
	22	4 Aurigæ	5.0	3	III–VII	21 10 4.3	6.5	10.8	4.1	15.8	7.0	8.08	28.259	. .	27.770
	23	Anon. $4^h\ 56^m\ 42^s$	. .	1	VI	14 0 2.8	5.2	7.8	1.9	10.6	9.2	5.45	29.388	. .	28.901
	24	Nadir	. .	.	. .	199 59 58.7	57.0	63.3	58.4	65.2	60.8	60.57	30.482	30.482	. .
15	25	Anon. $19^h\ 49^m\ 24^s$	. .	3	III–VII	96 55 4.9	2.8	8.0	1.0	12.3	9.0	6.33	32.477	30.537	31.948
	26	Lalande 38175	. .	3	V–IX	21 5 2.7	1.8	6.7	58.0	13.2	7.1	4.92	28.959	. .	28.406
	27	Anon. $20^h\ 3^m\ 47^s$	. .	3	III–VII	68 5 1.0	58.3	4.4	54.4	9.1	5.2	2.07	27.767	. .	27.232
	28	Anon. $20^h\ 9^m\ 46^s$	. .	2	V, VII	12 35 0.7	58.4	3.9	53.1	9.8	3.4	1.55	34.379	. .	33.822
	29	O. Arg. S. 20819	7.5	3	V–IX	83 5 1.0	57.7	2.8	54.0	7.4	2.9	0.97	36.416	. .	35.888
	30	Weisse 1359	7.2	3	III–VII	72 55 4.2	0.4	6.8	57.9	12.1	5.3	4.45	34.854	. .	34.319
	31	Anon. $21^h\ 16^m\ 4^s$	8.0	1	VII	10 5 6.0	4.8	10.7	0.6	14.7	7.5	7.38	33.703	. .	33.158
	32	Nadir	. .	.	. .	200 0 5.5	1.2	7.1	58.4	10.3	7.1	4.93	30.537	30.537	. .
16	33	Anon. $19^h\ 57^m\ 54^s$	8.5	1	V	78 0 3.0	0.9	7.9	0.0	10.9	7.5	5.03	32.338	30.564	31.774
	34	Anon. $19^h\ 58^m\ 59^s$	8.0	3	V–IX	“ “ “	“	“	“	“	“	“	39.791	. .	39.234
	35	Anon. $20^h\ 14^m\ 55^s$	8.0	2	V, VII	91 55 57.5	55.3	60.3	50.2	63.3	58.3	57.48	33.757	. .	33.213
	36	Anon. $20^h\ 49^m\ 8^s$	. .	3	III–VII	78 24 62.0	59.0	66.7	56.4	69.2	63.3	62.77	36.150	. .	35.589
	37	Anon. $20^h\ 57^m\ 31^s$	7.5	2	VII, IX	21 40 3.3	58.8	5.3	54.9	9.8	4.3	2.73	35.285	. .	34.697
	38	Anon. $21^h\ 16^m\ 4^s$	. .	3	III–VII	10 5 0.0	57.9	6.1	55.0	8.8	0.9	1.45	33.533	. .	32.958
	39	Lacaille 8873	. .	3	III–VII	93 55 1.5	58.1	4.4	56.5	6.7	4.1	1.88	29.574	. .	29.017
	40	Anon. $21^h\ 37^m\ 0^s$	8.0	3	III–VII	21 55 2.5	59.6	6.1	56.0	9.9	5.3	3.23	33.126	. .	32.555
	41	Anon. $21^h\ 52^m\ 32^s$	8.5	2	VII, IX	79 30 2.1	59.7	6.8	57.0	9.1	5.9	3.43	35.768	. .	35.216
	42	Anon. $22^h\ 10^m\ 56^s$	. .	3	III–VII	21 10 4.6	0.7	7.1	58.7	11.6	5.8	4.75	35.566	. .	34.995
	43	Anon. $22^h\ 26^m\ 9^s$	9.0	3	III–VII	52 4 57.3	53.0	60.1	50.0	64.7	61.4	57.75	27.943	. .	27.378
	44	Nadir	. .	.	. .	200 0 1.2	55.3	3.2	53.8	5.2	2.9	0.27	30.425	30.564	. .
	45	75 Pegasi	6.0	3	III–VII	41 10 5.2	1.8	9.0	59.1	12.3	10.4	6.30	31.438	. .	30.871
	46	Anon. $23^h\ 46^m\ 25^s$	6.0	3	V–IX	37 49 60.8	54.8	63.1	51.7	65.5	61.3	59.53	31.841	. .	31.269
	47	B. A. C. 8355 (1st *)	. .	2	III, V	353 30 3.7	1.4	9.8	56.8	11.8	6.1	4.93	33.059	. .	32.479
	48	B. A. C. 8355 (2d *)	. .	3	IV–VI	“ “ “	“	“	“	“	“	“	33.194	. .	32.624
	49	Lalande 713	6.5	3	III–VII	20 35 5.6	4.9	10.8	1.4	14.7	7.8	7.53	30.628	. .	30.056
	50	π Andromedæ	5.0	3	V–IX	25 50 0.8	59.7	5.0	56.1	7.8	3.2	2.10	29.531	. .	28.953
	51	ν Andromedæ	5.5	3	III–VII	18 30 4.2	1.7	9.7	0.2	10.8	5.1	5.28	33.234	. .	32.662
	52	φ^4 Ceti	. .	2	VII, IX	70 54 58.2	55.4	61.9	55.0	64.8	62.1	59.57	31.058	30.564	30.501
17	53	ϵ^2 Sagittarii	5.0	3	III–VII	75 15 2.4	59.2	9.0	0.4	8.7	4.8	4.08	27.167	30.624	26.546
	54	57 Sagittarii	5.5	3	V–IX	78 15 3.9	1.7	10.1	2.7	11.2	6.1	5.95	33.857	. .	33.240
	55	Anon. $19^h\ 57^m\ 54^s$	. .	2	III, VII	78 0 0.0	58.1	5.8	57.4	8.1	3.1	2.08	32.355	. .	31.736
	56	Anon. $19^h\ 58^m\ 59^s$	. .	3	V–IX	“ “ “	“	“	“	“	“	“	39.732	. .	39.115
	57	ξ^2 Capricorni	. .	3	III–VII	71 50 4.2	4.1	9.0	0.8	11.8	6.6	6.08	29.039	. .	28.417
	58	Anon. $20^h\ 15^m\ 8^s$	. .	3	III–VII	22 10 0.5	59.6	6.1	56.9	8.7	2.9	2.45	33.044	. .	32.413
	59	Anon. $20^h\ 16^m\ 56^s$	. .	2	VII, IX	“ “ “	“	“	“	“	“	“	36.072	. .	35.425
	60	Nadir	. .	.	. .	200 0 2.8	58.9	7.2	59.2	7.4	4.4	3.32	30.581	30.624	. .
	61	f^2 Cygni	. .	3	III–VII	11 45 4.0	2.4	10.7	2.1	11.4	4.4	5.83	32.637	. .	32.003
	62	Anon. $21^h\ 20^m\ 17^s$	8.3	3	III–VII	22 45 1.3	0.8	7.1	58.0	9.8	3.7	3.45	33.367	. .	32.736
	63	69 Cygni	6.5	1	IX	“ “ “	“	“	“	“	“	“	30.867	. .	30.208
	64	Anon. $21^h\ 37^m\ 0^s$	. .	3	III–VII	21 55 2.4	0.8	8.7	59.0	11.3	4.3	4.42	33.265	. .	32.634
	65	Weisse (2) 1196	7.0	3	III–VII	23 20 2.2	1.6	8.8	0.2	9.8	5.0	4.60	32.259	30.624	31.628

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 1 20.0	N. 26 31 15.7	29.4	+ 65 25 23.9	− 28.7	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.266	60.2	54.3	− 1 0.7	N. 17 0 56.8	17.8	+ 55 54 53.4	22.2	Y.	
. .	. .	. .	+ 6.4	S. 63 15 8.9	1 55.1	− 24 23 25.2	28.6	Y.	
. .	. .	. .	− 2 22.1	13 12 44.1	13.7	+ 25 40 41.0	24.8	Y.	
. .	. .	. .	+ 14.5	3 25 16.9	3.5	+ 35 28 18.4	22.8	Y.	
. .	. .	. .	− 1 5.9	61 43 58.2	1 48.0	− 22 52 7.4	28.8	Y.	
30.262	60.0	53 9	13.4	0 29 54.0	0.5	+ 38 23 44.3	21.3	Y.	
. .	. .	. .	2 13.1	0 22 48.4	0.4	38 30 50.0	20.3	Y.	
. .	. .	. .	− 1 58.2	0 23 3.3	0.4	+ 38 30 35.1	20.2	Y.	
. .	. .	. .	+ 28.7	S. 42 25 33.3	53.3	− 3 32 47.8	26.5	Y.	
30.256	59.0	53.6	2 15.6	N. 7 57 37.6	8.2	+ 46 51 24.6	16.6	Y.	
. .	. .	. .	1 7.4	S. 14 56 12.7	15.6	23 57 10.5	20.5	Y.	
. .	. .	. .	+ 1 38.3	14 56 43.5	15.6	23 56 39.7	20.4	Y.	
. .	. .	. .	− 0.2	3 50 2.4	3.9	+ 35 3 32.5	16.8	Y.	
30.250	58.8	53.4	− 1 31.2	70 13 32.9	2 40.8	− 31 22 34.9	28.9	Y.	
. .	. .	. .	+ 2 24.0	21 22 28.1	22.8	+ 17 30 47.9	19.5	Y.	
. .	. .	. .	+ 1 28.5	64 31 32.9	2 1.9	− 25 39 56.0	27.7	Y.	
30.248	58.5	53.1	− 1 48.4	69 33 18.6	2 35.3	30 42 15.1	28.2	Y.	
. .	. .	. .	+ 1 51.2	64 51 54.3	2 3.8	− 26 0 19.3	27.2	Y.	
. .	. .	. .	− 1.8	28 10 7.2	31.3	+ 10 43 0.3	18.9	Y.	
. .	. .	. .	+ 1 9.9	S. 1 11 18.0	1.2	37 42 19.6	10.7	Y.	
30.236	58.0	52.4	+ 34.4	N. 5 59 20.1	6.1	+ 44 53 5.0	− 8.1	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.220	67.0	66.0	− 1 1.1	S. 75 54 5.3	3 42.1	− 37 4 8.6	+ 4.1	Y.	
. .	. .	. .	+ 50.0	1 5 54.9	1.1	+ 37 47 42.8	− 19.3	Y.	
. .	. .	. .	+ 1 26.7	S. 48 6 28.8	1 3.3	− 9 13 53.3	7.0	Y.	
30.214	66.0	65.6	− 1 59.8	N. 7 26 58.2	7.4	+ 46 20 44.4	22.0	Y.	
30.220	66.0	63.0	3 4.5	S. 63 1 56.4	1 51.6	− 24 10 9.2	5.1	Y.	
. .	. .	. .	2 15.4	S. 52 52 49.1	1 15.3	− 14 0 25.6	10.0	Y.	
30.220	65.8	62.5	1 39.0	N. 9 56 31.6	10.0	+ 48 50 20.4	26.8	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	55.6	S. 57 59 9.4	1 29.7	− 19 7 0.3	3.0	Y.	
30.050	67.0	68.0	4 49.4	57 55 15.7	1 29.5	19 3 6.4	− 3.1	Y.	
. .	. .	. .	1 40.7	71 54 16.8	2 50.3	33 3 28.3	+ 0.3	Y.	
30.058	67.5	68.5	2 55.2	58 22 7.6	1 31.1	− 19 29 59.9	− 7.6	Y.	
. .	. .	. .	2 27.2	S. 1 37 35.5	1.6	+ 37 16 1.7	24.2	Y.	
30.058	67.8	67.3	− 1 32.7	N. 9 56 31.2	9.9	+ 48 50 19.9	27.0	Y.	
. .	. .	. .	+ 30.8	S. 73 55 32.7	3 13.0	− 35 5 6.9	6.7	Y.	
. .	. .	. .	− 1 20.1	1 53 43.1	1.9	+ 36 59 53.8	26.6	Y.	
30.080	67.2	65.0	2 43.5	59 27 20.0	1 35.7	− 20 35 16.9	13.2	Y.	
. .	. .	. .	− 2 36.5	1 7 28.2	1.1	+ 37 46 9.5	28.3	Y.	
30.080	67.0	63.2	+ 1 22.2	32 6 19.9	35.7	6 46 43.2	23.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.085	66.3	63.0	− 27.3	21 9 39.0	22.0	17 43 37.8	27.6	Y.	
. .	. .	. .	39.7	S. 17 49 19.8	18.3	21 4 0.7	28.8	Y.	
. .	. .	. .	1 17.7	N. 26 31 12.8	28.5	65 25 24.6	29.6	Y.	
30.006	66.0	61.8	1 22.2	N. 26 31 17.3	28.5	65 25 24.6	29.6	Y.	
. .	. .	. .	− 1.7	S. 0 35 5.8	0.6	38 18 32.4	29.5	Y.	
. .	. .	. .	+ 32.8	S. 5 50 34.9	5.8	33 2 58.1	29.3	Y.	
. .	. .	. .	− 1 23.4	N. 1 31 18.2	1.5	+ 40 24 58.5	28.9	Y.	
30.084	65.5	60.4	− 15.7	S. 50 54 43.9	1 10.3	− 12 2 15.4	26.7	Y.	
30.104	65.5	61.2	+ 1 48.2	55 16 52.3	1 22.3	16 24 35.8	1.9	Y.	
. .	. .	. .	− 1 41.6	58 13 24.4	1 32.1	19 21 17.7	1.8	Y.	
. .	. .	. .	54.4	57 59 7.7	1 31.3	19 7 0.2	3.0	Y.	
30.103	65.2	60.0	− 4 45.7	57 55 16.4	1 31.1	19 3 11.7	3.1	Y.	
. .	. .	. .	+ 49.6	51 50 55.7	1 12.8	− 12 58 29.7	5.9	Y.	
. .	. .	. .	− 1 15.7	2 8 46.8	2.2	+ 36 44 49.8	21.0	Y.	
. .	. .	. .	2 50.0	S. 2 7 12.4	2.1	36 46 24.3	21.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.112	64.7	58.2	1 2.8	N. 8 15 57.0	8.4	47 9 44.2	26.1	Y.	
. .	. .	. .	1 25.7	S. 2 43 37.7	2.7	36 9 58.4	25.6	Y.	
. .	. .	. .	6.5	2 44 56.9	2.8	36 8 39.1	25.7	Y	
. .	. .	. .	1 22.6	1 53 41.9	1.9	36 59 55.0	26.7	Y.	
30.110	63.5	56.8	− 51.0	S. 3 19 13.6	3.3	+ 35 34 21.9	− 27.2	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES. A.	B.	C.	D.	E.	F.	Mean.	MICROMETER. Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. Oct. 17	1	Piazzi 33	6.0	3	III-VII	42 20 0.9	0.3	6.2	57.0	8.4	4.0	2.80	34.855	30.624	34.228
	2	Anon. 22ʰ 14ᵐ 54ˢ .	8.5	2	III, VII	94 0 3.6	1.6	8.2	0.8	10.4	5.4	5.03	33.634	. .	33.020
	3	26 Cephei	. .	3	IV-VI	354 25 0.7	59.6	7.8	58.2	7.6	3 1	2.83	33.996	. .	33.366
	4	Anon. 22ʰ 38ᵐ 53ˢ .	. .	2	VII, IX	73 5 3.0	3 6	8.5	2.1	9.2	3.9	5.05	28.309	. .	27.693
	5	Anon. 22ʰ 50ᵐ 37ˢ .	8.0	2	III, VII	85 45 1.8	1.4	8.5	2.6	9.8	5.1	4.87	34.164	. .	33.547
	6	B. A. C. 8045 . .	6.0	3	III-VII	98 25 3.5	3.9	7.8	1.2	10.7	5.0	5.35	35.996	30.624	35.380
18	7	B. A. C. 8134 . .	6.5	3	III-VII	64 15 4.2	3.9	11.8	4.0	12.2	5.4	6.92	34.663	30.521	34.040
	8	B. A. C. 6844 . .	. .	3	III-VII	102 10 2.7	1.4	7.1	1.1	9.3	5.3	4.48	30.822	. .	30.310
	9	Anon. 20ʰ 4ᵐ 30ˢ .	7.8	3	III-VII	65 5 0.0	56.4	5.4	57.0	6.3	3.6	1.45	31.016	. .	30.496
	10	Anon. 20ʰ 11ᵐ 51ˢ .	. .	3	V-IX	22 10 2.8	0.4	7.8	59.2	10.5	4.2	4.15	25.780	. .	25.243
	11	Anon. 20ʰ 17ᵐ 6ˢ .	. .	2	IV, V	" " "	"	"	"	"	"	"	33.589	. .	33.066
	12	B. A. C. 7087 .	. .	2	VII, IX	73 0 6.1	5.1	11.6	3.6	15.2	8.5	8.35	29.281	. .	28.768
	13	Anon. 20ʰ 41ᵐ 29ˢ .	6.5	3	III-VII	78 25 4.2	2.9	10.2	2.6	12.8	6.9	6.60	35.318	. .	34.800
	14	Lacaille 8719 . .	5.5	3	V-IX	98 45 2.2	0.2	6.1	58.8	9.1	3.3	3.28	31.636	. .	31.132
	15	Anon. 21ʰ 20ᵐ 17ˢ .	8.2	3	III-VII	22 45 4.8	3.0	9.5	58.8	12.7	5.9	5.78	33.394	. .	32.866
	16	*d* Aquarii	6.0	3	III-VII	57 10 . .	2.0	9.1	0.7	12.2	8.9	5.87	28.617	. .	28.096
	17	*η* Piscis Australis .	5.0	2	VII, IX	87 50 7.1	2.9	9.8	0.7	12.5	9.1	7.02	23.591	. .	23.088
	18	Lacaille 9159 . .	. .	3	III-VII	90 30 3.2	2.1	9.8	59.4	10.3	5.0	4.97	30.632	. .	30.117
	19	Lacaille 9199 . .	6.2	2	VII, IX	88 15 2.1	0.2	6.9	57.1	8.0	4.7	3.17	32.078	. .	31.574
	20	Lacaille 9269 . .	6.5	2	VII, IX	82 35 0.8	57.0	4.7	57.2	6.4	0.1	1.03	28.528	. .	28.021
	21	Lalande 44918 . .	7.5	3	III-VII	20 10 0.8	58.6	6.1	56.4	9.6	1.4	2.15	32.089	. .	31.560
	22	Lacaille 9373 . .	. .	3	III-VII	89 35 3.4	3.0	9.6	58.9	10.9	5.1	5.15	34.419	. .	32.904
	23	B. A. C. 8134 . .	. .	3	III-VII	64 15 2.2	0.4	7.5	0.6	9.5	3.6	3.97	34.449	. .	33.929
	24	Lacaille 9534 . .	6.2	3	III-VII	91 25 0.0	59.8	4.7	58.0	6.2	2.0	1.78	33.202	. .	32.687
	25	B. A. C. 8252 . .	. .	2	VII, IX	6 25 7.8	7.1	14.1	5.0	15.2	8.8	9.67	30.650	. .	30.109
	26	Anon. 23ʰ 46ᵐ 25ˢ .	6.5	3	V-IX	37 50 3.0	3.4	10.9	1 7	12.5	6.5	6.33	32.109	. .	31.576
	27	B. A. C. 8364 . .	. .	3	IV-VI	1 5 3.5	4.5	11.2	2.0	13.5	6.2	6.82	35.329	. .	34.803
	28	Nadir	. .	.	. .	200 0 0.0	57.7	5.1	57.8	6.4	2.0	1.50	30.421	30.521	. .
Nov. 3	29	Anon. 20ʰ 19ᵐ 53ˢ .	. .	2	V, VI	354 35 4.8	6.0	12.3	1.1	14.5	5.8	7.42	29.226	30.452	28.769
	30	1 Aquarii	. .	2	V, IX	58 50 7.6	8.3	12.9	5.4	17.1	10.1	10.23	32.106	. .	31.654
	31	Anon. 20ʰ 49ᵐ 8ˢ .	. .	3	III-VII	78 25 0.4	3.2	7.7	0.2	8.8	2.0	3 72	36.261	. .	35.812
	32	*δ* Microscopii . .	. .	3	III-VII	89 30 2.9	5.2	9.3	3 1	10.1	4.0	5.77	34.958	. .	34.512
	33	Lacaille 8758 . .	. .	3	III-VII	90 4 59.0	1.3	4 6	57.8	6.1	59.3	1.35	27.842	. .	27.396
	34	Anon. 21ʰ 20ᵐ 17ˢ .	8.0	3	III-VII	22 45 1.2	4.1	7.8	0.8	9.6	2.3	4.30	33.280	. .	32.821
	35	Lacaille 8873 . .	6.0	2	III, V	93 55 1.2	1.7	6.8	0.2	8.7	1.8	3.80	29.758	. .	29.311
	36	Anon. 21ʰ 33ᵐ 4ˢ .	7.5	2	V, VII	" " "	"	"	"	"	"	"	30.940	. .	30.493
	37	Weisse (2) 1196 .	6.5	3	III-VII	23 20 4.7	6.5	11.5	5.2	13.2	5.5	7.77	32.238	. .	31.779
	38	*o* Aquarii . . .	5.5	2	V, IX	61 40 0.0	0.1	4.8	59.1	6.8	2.0	2.13	35.605	. .	35.154
	39	Anon. 22ʰ 11ᵐ 6ˢ .	. .	3	III-VII	21 10 1.8	3.2	8.3	1.8	9.8	3.2	4.68	35.115	. .	34.656
	40	Anon. 22ʰ 20ᵐ 42ˢ .	. .	3	III-VII	20 20 0.2	1.8	7.5	1.9	8.4	0.8	3.43	35.626	. .	35.166
	41	Anon. 22ʰ 38ᵐ 6ˢ .	. .	2	IV, V	8 5 6.1	8.1	13.8	8.8	13.6	6.2	9.43	34.243	. .	33.788
	42	Anon. 22ʰ 38ᵐ 42ˢ .	. .	2	VII, IX	" " "	"	"	"	"	"	"	30.452	. .	29.989
	43	Lalande 44918 . .	7.2	3	V-IX	20 10 0.2	2.9	8.0	0.9	9.5	1.0	3.75	32.108	. .	31.639
	44	O. Arg. S. 22656 .	. .	3	III-VII	86 25 59.4	0.4	6.2	2.2	6.1	0.8	2.52	28.559	. .	28.112
	45	Anon. 23ʰ 14ᵐ 47ˢ .	8.3	3	V-IX	64 20 2.7	4.5	9.9	4.4	10.2	2.1	5.63	32.867	. .	32.417
	46	Weisse (2) 639 . .	. .	1	V	23 45 0.0	1.1	5.5	0.2	6.2	59.1	3.15	28.770	. .	28.318
	47	Weisse (2) 658 . .	. .	2	VII, IX	" " "	"	"	"	"	"	"	30.675	. .	30.201
	48	B. A. C. 8364 . .	. .	3	V-IX	1 5 2.9	5.7	10.8	5.9	11.4	4.3	6.83	35.375	. .	34.890
	49	Lalande 849 . . .	6.0	3	V-IX	22 45 3.1	7.2	10.0	5.8	11.4	4.3	6.97	33.067	. .	32.600
	50	Lacaille 224 . . .	6.0	3	III-VII	82 55 0.0	2.4	4.9	4.8	6.0	0.9	3.17	33.801	. .	33.353
	51	Anon. 0ʰ 52ᵐ 0ˢ .	. .	3	V-IX	22 20 5.0	8.9	12.6	8.9	13.8	6.0	9.20	28.109	. .	27.642
	52	Nadir	. .	.	. .	200 0 1.9	4.0	8.2	6.6	7.3	5.1	5.52	30.480	30.452	. .
6	53	*δ* Microscopii . .	. .	3	III-VII	89 30 4.0	7.5	9.1	8.5	9.3	6.9	7.52	35 162	30.441	34.927
	54	Lacaille 8742 . .	. .	3	III-VII	95 35 3.5	6.5	9.5	7.0	10.0	6.1	7.10	34.625	. .	34.189
	55	Weisse 364 . . .	9.0	3	III-VII	70 5 4.1	7.7	11.3	8 8	12.7	8.0	8.77	29.652	. .	29.213
	56	Anon. 21ʰ 25ᵐ 3ˢ .	8.3	3	III-VII	84 40 0.7	3.9	8.1	5.4	8.9	4.1	5.18	35.446	. .	35.010
	57	Anon. 21ʰ 36ᵐ 11ˢ .	8.8	3	III-VII	24 45 3.8	7.6	11.8	8.4	11.7	6.1	8.23	31.581	. .	31.134
	58	Anon. 21ʰ 52ᵐ 32ˢ .	8.5	3	III-VII	79 30 0.0	3.5	6.9	5.9	6.8	3.0	4.35	35.870	. .	35.433
	59	Anon. 22ʰ 11ᵐ 4ˢ .	. .	3	III-VII	21 10 0.7	4.3	7.9	6.0	8.9	2.1	4 98	35.189	. .	34.741
	60	Anon. 22ʰ 20ᵐ 21ˢ .	. .	2	VII, IX	20 20 2.4	6.8	11.7	8.4	11.6	4.0	7.48	36.205	. .	35.747
	61	Anon. 22ʰ 30ᵐ 36ˢ .	8.0	3	V-IX	22 45 2.6	7.0	9.1	8.4	10.1	5.0	7.03	29.755	. .	29.299
	62	Anon. 22ʰ 38ᵐ 41ˢ .	. .	3	V-IX	80 20 2.0	8.4	9.1	8.0	9.7	6.6	7.30	25.736	. .	25.303
	63	Lalande 44918 . .	. .	3	III-VII	20 10 1.6	5.2	8.8	8.3	9.7	4.4	6.33	32.268	. .	31.819
	64	O. Arg. S. 22657 .	8.0	3	III-VII	86 25 0.2	4.8	5.2	10.9	6.5	3.9	5.25	31.517	. .	31.081
	65	Anon. 23ʰ 14ᵐ 47ˢ .	8.5	3	III-VII	64 20 1.7	6.0	7.7	9.2	7.8	3.9	6.05	32.839	30.441	32.399

Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 2 12.5	S. 22 17 50.3	23.7	+ 16 35 24.8	− 24.5	Y.	
. .	. .	. .	1 34.6	S. 73 58 30.4	3 18.1	− 35 8 9.7	10.7	Y.	
30.105	62.7	56.1	− 1 45.5	N. 25 36 42.7	27.7	+ 64 30 49.2	30.7	Y.	
. .	. .	. .	+ 1 12.3	S. 53 6 17.4	1 16.8	− 14 13 55.4	18.7	Y.	
. .	. .	. .	− 1 51.2	65 43 13.7	2 7.4	26 51 42.3	16.3	Y.	
30.108	62.0	55.4	2 48.6	78 22 16.8	4 33.6	39 33 11.6	13.9	Y.	
. .	. .	. .	2 6.6	44 13 0 3	56.2	5 20 17.7	− 23.3	Y.	
29.994	66.2	65.0	9.7	82 9 54.8	6 28.0	43 22 41.0	+ 6.0	Y.	
. .	. .	. .	15.5	45 4 45.9	56.6	− 6 12 3.7	− 8.1	Y.	
. .	. .	. .	2 29.1	2 12 33.2	2.2	+ 36 41 3.4	20.8	Y.	
. .	. .	. .	− 1 36.1	2 8 28.1	2.1	+ 36 45 8.6	21.3	Y.	
30.008	66.2	64.0	+ 38.6	53 0 46.9	1 15.1	− 14 8 23.2	7.5	Y.	
30.016	66.0	63.0	− 2 30.4	58 22 36 2	1 31.9	19 30 29.3	6.9	Y.	
. .	. .	62.8	35.5	78 44 27.8	4 37.2	− 39 55 26.2	2.3	Y.	
. .	. .	. .	− 1 29.8	2 43 36.0	2.7	+ 36 10 0.1	25.7	Y.	
. .	65.8	61.8	+ 59.7	37 11 5.5	43.2	+ 1 41 50.1	18.3	Y.	
. .	. .	61.6	+ 3 36.6	17 53 43.6	2 19.2	− 29 2 24.0	10.4	Y.	
. .	65.0	61.6	− 3.7	70 30 1.3	2 39.3	31 39 1.8	12.5	Y.	
. .	. .	. .	− 49.3	68 14 13.8	2 21.7	29 22 56.7	13.8	Y.	
. .	. .	. .	+ 1 2.0	62 36 3.0	1 49.6	− 23 44 13.8	16.4	Y.	
. .	. .	. .	− 48.9	0 9 13.2	0 2	+ 38 44 25.4	30.0	Y.	
30.020	64.8	60.3	1 31.0	69 33 34.2	2 31.9	− 30 42 27.3	16.0	Y.	
. .	. .	. .	2 3.1	44 13 0.8	55.5	5 20 17.5	23.3	Y.	
. .	. .	. .	1 24.2	S. 71 23 37.6	2 48.1	− 32 32 46.9	18.1	Y.	
30.020	63.5	59.2	3.4	N. 13 34 53.7	13.8	+ 52 28 46.3	31.0	Y.	
. .	. .	. .	49.4	S. 17 49 16.9	18.4	21 4 3.5	28.9	Y.	
30.014	63.5	58.8	− 2 30.5	N. 18 57 23.7	19.7	57 51 22.2	30.5	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.084	53.2	48.2	+ 38.6	N. 25 24 14.0	27.8	64 18 20.6	25.1	Y.	
. .	. .	. .	− 51.8	S. 38 49 18.4	47.2	+ 0 3 33.2	12.4	Y.	
30.100	53.0	47.8	3 2.1	58 22 1.6	1 35.0	− 19 29 57.8	6.9	Y.	
. .	. .	47.5	− 2 21.4	69 27 44.4	2 35.5	30 36 41.1	3.8	Y.	
. .	. .	. .	+ 1 21.6	70 6 23.0	2 41.0	− 31 15 25.2	4.6	Y.	
. .	. .	. .	− 1 28.4	2 43 35.9	2.8	+ 36 10 0.1	26.7	Y.	
. .	. .	. .	+ 21.6	73 55 25.4	3 21.3	− 35 5 7.9	5.3	Y.	
30.120	52.5	47.0	− 15.4	73 54 48.4	3 21.3	− 35 4 30.9	5.3	Y.	
. .	. .	. .	55.7	3 19 12.0	3.4	+ 35 34 23.4	28.7	Y.	
. .	. .	. .	2 41.5	41 37 20.6	52.3	− 2 44 34.1	18.4	Y.	
. .	. .	. .	2 25.9	1 7 38.8	1.2	+ 37 45 58.8	30.2	Y.	
. .	. .	. .	2 41.9	S. 0 17 21.5	0.3	38 36 17.0	31.0	Y.	
. .	. .	. .	− 1 58.7	N. 11 56 49.3	12.5	50 50 40.6	33.5	Y.	
30.126	51.8	44.0	+ 0.3	N. 11 54 50.2	12.5	50 48 41.5	33.6	Y.	
. .	. .	. .	− 51.4	S. 0 9 12.4	0.2	+ 38 44 26.2	32.3	Y.	
. .	. .	. .	+ 59.1	66 26 1.7	2 15.3	− 27 34 38.2	15.3	Y.	
. .	. .	. .	− 1 15.8	44 18 49.9	58.0	− 5 26 9.1	22.6	Y.	
. .	. .	. .	+ 52.7	3 45 55.9	3.9	+ 35 7 39.0	32.6	Y.	
. .	. .	. .	− 6.3	S. 3 44 56.8	3.9	35 8 38.1	32.6	Y.	
30.150	50.2	41.7	2 33.2	N. 18 57 26.4	20.5	57 51 25.7	34.8	Y.	
. .	. .	. .	1 21.5	S. 2 43 45 5	2.8	+ 36 9 50.5	32.7	Y.	
30.180	49.5	40.2	− 1 45.1	62 53 18.1	1 56.2	− 24 1 35.5	22.3	Y.	
. .	. .	. .	+ 1 13.9	2 21 23.1	2.5	+ 36 32 13.2	32.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.326	47.8	39.3	− 2 28.1	69 27 39.4	2 39.4	− 30 36 40.0	3.6	Y.	
. .	. .	. .	− 2 11.3	75 32 55.8	3 49.8	36 43 6.8	2.4	Y.	
. .	. .	. .	+ 24.7	50 5 33.4	1 12.0	11 13 6.6	12.1	Y.	
30.340	47.0	38.6	− 2 37.0	64 37 28.2	2 6.5	− 25 45 55.9	7.6	Y.	
. .	. .	. .	35.5	4 44 32.7	5.0	+ 34 9 1.1	27.5	Y.	
30.348	46.0	36.6	2 50.3	59 27 14.1	1 42.3	− 20 35 17.6	11.7	Y.	
. .	. .	. .	2 28.6	1 7 36.4	1.2	+ 37 46 1.2	30.5	Y.	
. .	. .	. .	− 3 0.1	0 17 7.4	0.3	38 36 31.1	31.2	Y.	
. .	. .	. .	+ 22.0	2 45 29.0	2.9	+ 36 8 6.9	31.2	Y.	
30.350	45.0	35.2	+ 2 27.2	60 22 34.5	1 46.5	− 21 30 42.2	14.9	Y.	
. .	. .	. .	− 57.0	0 9 9.3	0.2	+ 38 44 29.3	32.6	Y.	
30.350	44.0	35.0	33.9	66 24 31.4	2 18.4	− 27 33 11.0	14.9	Y.	
. .	. .	. .	− 1 15.2	S. 44 18 50.8	59.3	− 5 26 11.3	− 22.4	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. Nov. 6	1	Weisse (2) 639 . .	7.0	3	V–IX	23 45 0.6	5.8	6.8	7.0	6.1	4.1	5.07	28.913	30.441	28.465
	2	Weisse (2) 658 . .	6.0	2	VII, IX	" " "	"	"	"	"	"	"	30.820	. .	30.357
	3	Anon. 23h 41m 35s .	8.0	3	IV–VI	355 25 1.4	7.7	9.9	8.8	8.2	4.8	6.80	29.097	. .	28.650
	4	Lacaille 9701 . .	7.0	2	VII, IX	94 15 2.0	6.4	8.1	9.8	7.4	5.2	6.48	29.416	. .	28.997
	5	49 Piscium	7.0	3	III–VII	43 30 3.7	7.9	9.3	11.6	7.3	. .	7.16	28.358	. .	27.914
	6	B. A. C. 122 . . .	6.5	2	VII, IX	43 30 3.7	7.9	9.3	11.6	7.3	. .	7.16	26.612	. .	26.162
	7	Anon. 0h 42m 32s .	7.0	3	III–VII	18 30 3.6	9.2	11.6	13.0	10.8	5.3	8.92	33.802	. .	33.353
	8	Anon. 0h 51m 41s .	. .	3	III–VII	57 5 . .	8.5	9.7	12.0	10.6	7.5	8.31	34.330	. .	33.909
	9	Anon. 1h 23m 19s .	7.5	3	III–VII	96 20 2.8	9.2	9.3	12.5	9.4	5.4	8.10	35.660	. .	35.226
	10	Nadir	. .	.	. .	200 0 2.0	7.9	8.7	11.9	6.8	5.0	7.05	30.489	30.441	. .
7	11	Anon. 2h 9m 27s . .	8.5	3	IV–VI	3 35 3.0	8.2	10.2	10.2	10.2	7.2	8.17	29.633	30.393	29.236
	12	Anon. 2h 12m 19s .	7.7	3	IV–VI	" " "	"	"	"	"	"	"	34.650	. .	34.253
	13	O. Arg. S. 1554 . .	. .	3	III–VII	83 15 2.4	6.6	8.5	9.1	9.2	6.0	7.02	30.366	. .	29.977
	14	O. Arg. S. 1558 . .	. .	1	IX	" " "	"	"	"	"	"	"	25.942	. .	25.571
	15	B. A. C. 809 . . .	6.0	3	III–VII	93 55 4.5	9.0	10.1	11.8	11.4	7.1	8.98	28.659	. .	28.273
	16	Nadir	. .	.	. .	199 59 58.7	2.7	4.1	5.1	4.2	3.2	3.00	30.341	30.393	. .
	17	Anon. 3h 38m 23s .	8.2	3	III–VII	34 54 59.4	63.7	65.1	65.2	64.8	62.6	63.47	28.519	. .	28.122
	18	Weisse (2) 1143 . .	8.5	3	V–IX	23 50 4.7	10.2	11.5	13.0	11.6	7.5	9.75	30.661	. .	30.253
	19	Anon. 4h 18m 17s .	. .	3	V–IX	84 30 1.6	7.3	8.9	10.3	9.9	6.4	7.40	27.654	. .	27.271
	20	Anon. 4h 53m 22s .	. .	3	III–VII	20 15 2.7	7.8	9.8	10.3	10.2	6.1	7.82	26.517	30.393	26.116
12	21	Lacaille 8760 . .	. .	3	III–VII	98 10 4.9	5.0	8.0	4.3	11.4	8.3	6.98	31.473	30.438	31.043
	22	Weisse 364 . . .	9 0	2	V, IX	70 5 2.2	2.6	5.0	3.2	9.1	6.0	4.68	29.337	. .	28.904
	23	Anon. 21h 25m 3s .	8.5	3	III–VII	84 40 6.6	8.2	11.2	7.6	12.5	11.9	8.00	35.468	. .	35.035
	24	Anon. 21h 36m 11s .	. .	3	V–IX	24 45 1.8	2.1	5.1	2.6	6.2	3.9	3.62	31.283	. .	30.831
	25	Anon. 21h 52m 23s .	6.0	2	V, VI	10 50 0.0	0 7	3.2	1.8	5.7	2.9	2.38	33.856	. .	33.413
	26	B. A. C. 7729 . .	7.0	3	III–VII	86 35 2.9	2.0	5.8	4.9	8.7	6.9	5.20	27.597	. .	27.164
	27	Anon. 22h 14m 54s .	8.0	2	I, IX	94 0 3.9	3.8	7.0	3.9	9.8	7.1	5.92	33.481	. .	33.077
	28	Anon. 22h 15m 1s .	7.5	3	III–VII	" " "	"	"	"	"	"	"	37.004	. .	36.573
	29	Anon. 22h 40m 14s .	8.0	3	III–VII .	80 20 2.2	5.2	8.1	7.3	10.3	7.6	6.78	34.493	. .	34.059
	30	Lacaille 9315 (1st *).	9.0	3	III–VII	85 40 1.0	1.5	4.3	3.7	7.8	4.6	3.82	29.263	. .	28.830
	31	Anon. 23h 11m 37s .	8.0	2	VII, IX	65 5 0.2	2.7	4.2	3.0	8.2	4.1	3.73	33.338	. .	32.903
	32	Anon. 23h 20m 29s .	7.0	2	V, VI	352 40 4.6	6.7	9.0	7.2	12.5	6.8	7.80	32.969	. .	32.526
	33	Weisse (2) 639 . .	. .	3	III–VII	23 45 0.1	2.1	3.8	1.3	7.9	2.2	2.90	28.843	. .	28.398
	34	Weisse (2) 658 . .	. .	2	VII, IX	" " "	"	"	"	"	"	"	30 702	. .	30.242
	35	Radcliffe 65 . . .	. .	1	V	14 40 3.2	6.0	8.0	6.2	10.5	6.5	6.75	34.868	. .	34.430
	36	Radcliffe 73 . . .	. .	1	V	" " "	"	"	"	"	"	"	34.847	. .	34.409
	37	Weisse 446 . . .	8.5	3	III–VII	55 10 4.6	6.5	10.1	8.0	12.9	9.2	8.55	30.958	. .	30.519
	38	O. Arg. S. 447 . .	6.0	3	V–IX	82 55 2.2	4.4	5.6	5.8	7.2	6.2	5.23	33.826	. .	33.397
	39	Anon. 0h 52m 0s . .	. .	3	III–VII	22 20 59.2	2.2	3.1	3.1	7.7	3.9	3.20	28.065	. .	27.620
	40	O. Arg. S. 644 . .	7.5	3	III–VII	87 15 4.6	6.0	8.5	8.9	10.2	10.0	8.03	33.109	. .	32.676
	41	41 Ceti	. .	3	III–VII	67 10 5.1	8.1	10.7	10.3	13.2	9 9	9.55	29.388	. .	28.951
	42	Anon. 1h 23m 19s .	. .	3	III–VII	96 20 2.1	6.3	7.9	7.0	10.5	6.2	6.67	35.356	. .	34.925
	43	Nadir	. .	.	. .	200 0 1.8	4.7	7.1	5.9	8.2	7.2	5.82	30.476	30.438	. .
13	44	η Ceti	. .	3	V–IX	69 40 5.0	8.7	8.7	10.8	11.3	12.2	9.45	26.628	30.446	26.186
	45	41 Ceti	. .	3	V–IX	67 10 0.0	0.8	3.1	3.3	5.3	4.4	2.82	29.816	. .	28.743
	46	ρ Piscium	. .	3	III–VII	40 19 56.4	59.2	59.1	0.9	2.2	3.1	0.15	28.828	. .	28.379
	47	Anon. 1h 26m 31s .	. .	2	III, VII	43 50 1.2	4.2	3.6	4.2	7.1	. .	4.26	32.747	. .	32.288
	48	B. A. C. 563 . . .	. .	3	III–VII	97 50 1.8	4.9	5.6	4.0	8.7	6.0	5.17	30.200	. .	29.762
	49	B. A. C. 578 . . .	. .	3	III–VII	98 0 3.2	6.3	7.1	5.9	9.2	7.1	6 47	28.989	. .	28.551
	50	Anon. 2h 1m 40s . .	8.5	3	III–VII	19 50 2.4	5.5	7.7	5.8	10.7	7.0	6.52	25.536	. .	25.082
	51	Anon. 2h 2m 37s . .	9.2	1	IX	" " "	"	"	"	"	"	"	31.982	. .	31.496
	52	Anon. 2h 17m 46s .	8.5	3	IV–VI	2 15 1.1	4.8	7.8	7.3	10.5	6.1	6.27	30.183	. .	29.732
	53	O. Arg. N. 2729 . .	7.8	2	IV, VI	" " "	"	"	"	"	"	"	34.053	. .	33.600
	54	ν Ceti	5.0	3	III–VII	53 50 0.6	3.9	2.9	4.1	6.7	4.5	3.78	32.104	. .	31.657
	55	41 Arietis	. .	3	III–VII	32 10 2.3	6.9	6.3	6.4	9.2	7.0	6.35	34.787	. .	34.336
	56	Anon. 2h 54m 12s .	7.0	3	V–IX	20 30 0.0	3.0	4.6	3.4	7.9	2.2	3.52	30.924	. .	30.461
	57	Anon. 3h 5m 12s . .	. .	2	III, V	20 25 0.3	5.2	6.0	6.2	8.5	3.2	4.90	34.935	. .	34.483
	58	Anon. 3h 5m 29s . .	. .	3	V–IX	" " "	"	"	"	"	"	"	34.675	. .	34.212
	59	Weisse (2) 209 . .	7.5	3	III–VII	35 15 0.3	3.1	3.0	3.2	6.3	3.9	3.30	30.344	. .	29.894
	60	Anon. 3h 28m 3s . .	. .	3	III–VII	27 35 0.5	6.5	5.8	6.9	8.8	5.2	5.53	26.667	. .	26.215
	61	Anon. 3h 39m 21s .	. .	3	III–VII	35 40 2.3	5.9	6.9	8.0	9.3	6.2	6.43	33.442	. .	32.992
	62	Anon. 3h 51m 18s .	. .	2	VII, IX	85 55 2.0	6.3	6.8	8.1	8.3	6.9	6.40	36.815	. .	36.385
	63	Anon. 4h 8m 26s . .	. .	3	V–IX	90 24 57.7	63.3	62.2	63.9	64.2	60.7	62.00	28.089	. .	27.656
	64	Anon. 4h 35m 38s .	8.5	3	III–VII	84 55 0.8	6.7	7.1	8.4	9.4	6.8	6.53	36.541	. .	36.100
	65	Weisse 925 . . .	8.3	3	III–VII	57 35 . .	6.2	4.4	7.4	9.6	7.4	5.69	33.134	30.446	32.688

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	+ 48.1	S. 3 45 53.2	4.0	+ 35 7 41.6	− 32.9	Y.	
2	. .	. .	. .	− 11.2	S. 3 44 53.9	4.0	35 8 40.9	32.9	Y.	
3	30.356	43.5	34.0	+ 42.3	N. 24 34 10.9	27.8	+ 63 28 17.5	35.8	Y.	
4	. .	. .	. .	31.4	S. 74 15 37.9	3 33.2	− 35 25 32.3	16.2	Y.	
5	. .	. .	. .	1 5.4	23 31 12.5	26.6	+ 15 21 59.7	29.9	Y.	
6	30.364	42.5	33.2	+ 2 0.3	S. 23 32 7.4	26.6	15 21 4.8	29.9	Y.	
7	. .	. .	. .	− 1 45.1	N. 1 31 36.2	1.6	40 25 16.6	33.3	Y.	
8	30.360	42.0	33.0	2 2.5	S. 37 3 5.8	46.1	+ 1 49 46.9	27.5	Y.	
9	30.372	42.0	32.4	− 2 43.8	S. 76 17 24.3	4 6.2	− 37 27 51.7	20.9	Y.	
10	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
11	. .	. .	. .	+ 23.9	N. 16 24 27.9	17.9	+ 55 18 24.6	28.9	Y.	
12	30.326	40.0	34.7	− 2 13.3	N. 16 27 5.1	18.0	+ 55 21 1.9	28.7	Y.	
13	. .	. .	. .	+ 0.7	S. 63 15 7.7	2 0.2	− 24 23 29.1	24.3	Y.	
14	. .	. .	. .	2 18.8	63 17 25.8	2 0.4	24 25 47.4	24.3	Y.	
15	30.326	39.7	33.9	54.1	73 56 3.1	3 28.7	− 35 5 53.0	23.3	Y.	
16	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
17	30.300	40.0	34.7	+ 58.8	14 56 2.3	16.2	+ 23 57 20.3	22.4	Y.	
18	. .	. .	. .	− 7.9	3 50 1.8	4.1	+ 35 3 32.9	19.8	Y.	
19	30.280	40.0	34.4	+ 1 25.5	64 31 32.9	2 6.9	− 25 40 1.0	23.2	Y.	
20	30.266	39.5	34.0	+ 2 1.7	0 17 9.5	0.3	+ 38 36 29.0	12.5	Y.	
21	30.140	50.0	46.0	− 32.7	78 9 34.3	4 34.5	− 39 20 30.0	1.5	Y.	
22	. .	. .	. .	+ 34.3	50 5 39.0	1 10.5	11 13 10.7	11.8	Y.	
23	30.133	50.0	45.3	− 2 37.8	64 37 30.2	2 4.0	− 25 45 55.4	7.2	Y.	
24	. .	. .	. .	26.0	S. 4 44 37.6	4.9	+ 34 8 56.3	27.4	Y.	
25	30.138	49.2	43.0	− 1 47.0	N. 9 11 44.6	9.6	+ 48 5 33.0	31.4	Y.	
26	. .	. .	. .	+ 1 28.9	S. 66 36 34.1	2 16.5	− 27 45 11.8	9.7	Y.	
27	. .	. .	. .	− 1 36.4	73 58 29.5	3 24.2	35 8 14.9	8.0	Y.	
28	30.136	48.5	42.1	3 26.0	73 56 40.0	3 23.9	35 6 25.1	8.0	Y.	
29	. .	. .	. .	− 2 7.2	59 57 59.6	1 42.6	21 6 3.4	14.6	Y.	
30	30.126	47.0	41.4	+ 36.7	65 40 40.5	2 11.1	26 49 12.8	13.4	Y.	
31	. .	. .	. .	− 1 31.0	S. 45 3 32.8	59.6	− 6 10 53.6	21.6	Y.	
32	30.132	47 0	41.2	− 1 19.2	N. 27 21 11.4	30.8	+ 66 15 21.0	27.0	Y.	
33	. .	. .	. .	+ 50.2	S. 3 45 53.1	3.9	35 7 41.8	33.4	Y.	
34	. .	. .	. .	− 7.6	S. 3 44 55 3	3.9	35 8 39.6	33.4	Y.	
35	. .	. .	. .	2 18.8	N. 5 22 12.1	5.6	44 15 56.5	35.1	Y.	
36	30.127	46.2	39.6	2 18.2	N. 5 22 11.4	5.6	44 15 55.8	35.1	Y.	
37	. .	. .	. .	16 2	S. 35 9 52.3	42.1	+ 3 43 3.4	27.3	Y.	
38	30.130	45.8	38.2	− 1 46.5	62 53 18.8	1 56.6	− 24 1 36.6	20.7	Y.	
39	. .	. .	. .	+ 1 14.6	2 21 17.8	2.5	+ 36 32 18.5	33.3	Y.	
40	. .	. .	. .	− 1 23.9	67 13 44.2	2 21.9	− 28 22 27.3	20.5	Y.	
41	30.124	45.0	38.2	+ 32.9	47 10 42.4	1 4.6	8 18 8.2	25.2	Y.	
42	. .	. .	38.4	− 2 34.3	76 17 32.3	4 1.2	37 27 54.7	19.4	Y.	
43	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
44	30.292	45.5	39.0	+ 1 59.5	49 42 9.0	1 10.9	10 49 41.1	24.4	Y.	
45	. .	. .	. .	39.4	47 10 42.2	1 4.9	− 8 18 8.3	25.1	Y.	
46	. .	. .	. .	+ 50.8	20 20 51.0	22.3	+ 18 32 25.5	30.1	Y.	
47	30.292	45.0	38.4	− 1 11.7	23 48 52.5	26.6	+ 15 4 19.7	29.5	Y.	
48	. .	. .	. .	+ 7.5	77 50 12.6	4 33.1	− 39 1 6.9	19.7	Y.	
49	30.292	45.2	38.3	45.4	S. 78 0 51.9	4 37.1	− 39 11 50.2	19.8	Y.	
50	. .	. .	. .	+ 2 34.1	N. 0 7 19.4	0.1	+ 39 0 58.3	30.4	Y.	
51	. .	. .	. .	− 46.9	0 10 40.4	0.2	39 4 19.4	30.4	Y.	
52	. .	. .	. .	+ 8.4	17 44 45.3	19.3	56 38 43.4	29.5	Y.	
53	30.292	45.0	37.9	− 1 52.8	N. 17 46 46.6	19.3	56 40 44.7	29.6	Y.	
54	. .	. .	. .	51.9	S. 33 49 11.8	40.4	5 3 46.6	26.4	Y.	
55	. .	. .	. .	2 15.9	12 7 50.4	13.0	26 45 35.4	27.0	Y.	
56	. .	. .	. .	14.4	0 29 49.1	0.5	38 23 49.2	26.3	Y.	
57	. .	. .	. .	2 20.5	0 22 44.4	0.4	38 30 54.0	25.3	Y.	
58	. .	. .	. .	− 2 12.0	0 22 52.9	0.4	38 30 45.5	25.2	Y.	
59	30.286	43.5	35.5	+ 3.3	15 15 6.6	16.5	23 38 15.7	24.8	Y	
60	. .	. .	. .	+ 1 58.6	7 37 4.1	8.1	31 16 26.6	3.2	Y.	
61	. .	. .	. .	− 1 33.7	15 38 32.7	17.0	+ 23 14 49.1	22.5	Y.	
62	30.294	42.2	35.0	3 20.1	65 51 46.3	2 14.7	− 27 0 22.2	22.7	Y.	
63	. .	. .	. .	1 13.5	70 26 15.5	2 49.4	31 35 26.1	21.9	Y.	
64	30.300	41.5	34.1	3 11.2	64 51 55.4	2 9.0	− 26 0 25.6	21.1	Y.	
65	. .	. .	. .	− 1 24.2	S. 37 33 41.4	46.8	+ 1 19 10.6	− 18.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. Nov. 13	1	(* 129) Washington	8.5	3	III-VII	52 55 0.2	5.3	5.1	7.0	8.0	5.9	5.25	29.146	30.446	28.699
	2	Nadir	. .	.	. .	200 0 1.7	5.1	6.1	7.0	7.7	7.0	5.77	30.483	30.446	. .
20	3	Anon. $0^h\ 51^m\ 41^s$	8.5	3	III-VII	57 5 . .	8.4	8.1	8.1	11.6	9.0	8.17	34.346	30.455	33.891
	4	O. Arg. S. 644	. .	3	III-VII	87 15 3.8	6.2	6.1	6.4	8.5	6.9	6.32	33.088	. .	32.63
	5	41 Ceti	. .	3	III-VII	67 10 1.8	5.2	7.1	8.5	8.2	6.3	6.18	29.346	. .	28.89
	6	Anon. $1^h\ 26^m\ 31^s$	9.0	2	V, VII	43 50 1.8	5.2	6.1	7.8	7.4	6.2	5.75	32.730	. .	32.25
	7	B. A. C. 491	5.5	3	III-VII	68 55 1.5	5.2	7.1	8.2	8.3	6.2	6.08	32.324	. .	31.871
	8	B. A. C. 563	. .	3	V-IX	97 50 1.6	5.0	5.2	6.5	7.2	4.9	5.07	30.231	. .	29.79
	9	B. A. C. 578	. .	3	III-VII	98 0 3.8	7.1	8.3	8.2	9.1	6.3	7.13	29.123	. .	28.670
	10	Anon. $2^h\ 9^m\ 27^s$	8.0	3	IV-VI	3 35 0.1	7.1	7.8	8.1	7.3	5.6	6.00	29.640	. .	29.181
	11	Anon. $2^h\ 12^m\ 19^s$	7.0	3	IV-VI	" " "	"	"	"	"	"	"	34.687	. .	34.22
	12	O. Arg. S. 1547	8.2	3	III-VII	83 25 1.7	5.3	5.8	9.0	5.8	4.7	5.38	34.613	. .	34.16
	13	Lacaille 702	. .	3	III-VII	88 5 5.0	9.1	9.9	11.9	10.0	8.1	9.00	30.799	. .	30.34
	14	Lacaille 873	6.0	3	III-VII	81 50 3.1	6.1	7.8	10.2	8.6	7.0	7.13	27.961	. .	27.51
	15	Anon. $2^h\ 58^m\ 17^s$	. .	3	III-VII	21 45 0.8	5.8	6.3	8.7	6.4	5.6	5.60	27.864	. .	27.40
	16	Anon. $3^h\ 5^m\ 12^s$	. .	2	III, V	20 25 3.3	8.2	9.2	10.7	9.5	6.6	7.92	35.138	. .	34.67
	17	Anon. $3^h\ 5^m\ 34^s$	. .	2	VII, IX	" " "	"	"	"	"	"	"	34.629	. .	34.14
	18	Anon. $3^h\ 28^m\ 15^s$	.	2	II, III	12 0 1.2	7.2	7.1	11.8	8.3	5.1	6.78	26.073	. .	25.61
	19	Anon. $3^h\ 28^m\ 35^s$	. .	1	VII	" " "	"	"	"	"	"	"	26.247	. .	25.77
	20	Anon. $3^h\ 38^m\ 23^s$	7.5	2	V, VII	34 55 1.2	6.2	5.3	8.7	5.3	4.1	5.13	28.572	. .	28.09
	21	Anon. $3^h\ 38^m\ 35^s$	5.5	2	I, IX	" " "	"	"	"	"	"	"	32.362	. .	31.90
	22	τ^8 Eridani	. .	3	III-VII	83 50 0.3	4.5	6.0	7.5	4.8	1.9	4.17	30.819	. .	30.36
	23	Lacaille 1346	. .	3	V-IX	90 15 3.4	7.8	8.9	9.8	8.5	4.5	7.15	33.432	. .	32.99
	24	Anon. $4^h\ 11^m\ 33^s$	. .	3	III-VII	41 20 3.5	8.8	10.0	11.1	10.4	8.9	8.78	25.997	. .	25.53
	25	Anon. $4^h\ 18^m\ 17^s$	7.5	3	V-IX	84 29 59.2	64.7	67.1	68.1	66.1	64.0	64.87	27.566	. .	27.12
	26	B. A. C. 1404	7.0	3	III-VII	89 35 0.8	5.7	4.6	6.9	5.5	2.4	4.32	33.718	. .	33.26
	27	Anon. $4^h\ 35^m\ 38^s$	8.5	3	III-VII	84 50 1.2	4.3	8.0	9.9	6.2	5.1	5.78	26.901	. .	26.451
	28	Anon. $4^h\ 41^m\ 42^s$	. .	3	V-IX	48 10 4.2	7.8	10.3	12.3	11.2	8.2	9.00	30.496	. .	30.03
	29	Anon. $4^h\ 52^m\ 11^s$	. .	3	V-IX	20 15 3.8	9.9	12.3	14.0	11.6	8.3	9.98	28.424	. .	27.95
	30	(* 129) Washington	. .	3	V-IX	52 55 7.0	6.7	8.1	11.8	7.1	5.6	6.88	29.270	. .	28.81
	31	Nadir	. .	.	. .	200 0 1.9	6.9	7.8	10.2	6.8	5.0	6.43	30.533	30.455	. .
27	32	B. A. C. 8139	. .	3	V-IX	21 0 2.3	4.3	6.9	6.0	9.8	7.2	6.08	33.595	30.575	33.00
	33	Lacaille 9534	. .	3	III-VII	91 25 2.1	5.7	7.0	4.8	9.1	6.0	5.78	33.225	. .	32.65
	34	21 Piscium	5.5	3	III-VII	58 30 3.2	5.4	7.9	4.8	11.7	8.1	6.85	32.963	. .	32.38
	35	Lacaille 9680	. .	3	III-VII	84 10 3.2	6.1	7.9	4.7	9.7	7.7	6.55	28.532	. .	27.96
	36	5 Ceti	. .	3	III-VII	62 0 0.0	0.0	3.1	57.3	5.2	4.0	1.60	30.046	. .	29.47
	37	Lacaille 78	. .	3	V-IX	90 10 3.8	7.0	8.9	2.0	9.8	8.3	6.63	25.217	. .	24.655
	38	Lalande 849	7.2	3	III-VII	22 45 4.1	6.3	7.6	3.5	10.2	8.0	6.62	33.209	. .	32.627
	39	Anon. $0^h\ 42^m\ 19^s$	. .	3	III-VII	18 25 2.7	4.3	7.0	3.5	9.2	5.1	5.30	30.007	. .	29.43
	40	64 Ceti	5.5	3	III-VII	70 55 0.2	1.7	4.0	1.8	6.5	5.0	1.92	31.173	. .	30.600
	41	Nadir	. .	.	. .	200 0 2.7	4.9	6.1	3.2	7.7	7.5	5.35	30.575	30.575	. .
30	42	B. A. C. 7599	. .	3	III-VII	72 10 2.7	4.3	7.8	5.9	7.9	3.5	5.35	31.035	30.518	30.51
	43	30 Aquarii	. .	3	III-VII	66 0 2.9	3.9	8.6	6.7	9.1	3.9	5.85	32.082	. .	31.565
	44	O. Arg. S. 21975	6.0	3	III-VII	85 45 3.2	5.2	10.0	8.4	10.4	5.2	7.07	26.453	. .	25.94
	45	Anon. $22^h\ 17^m\ 31^s$	9.0	3	V-IX	22 10 0.5	2.8	6.1	2.5	4.2	0.5	2.77	35.635	. .	35.10
	46	60 Aquarii	. .	3	III-VII	61 4 57.8	0.7	2.9	58.5	2.5	0.3	0.45	30.906	. .	30.38
	47	Anon. $22^h\ 38^m\ 55^s$	9.0	3	III-VII	73 5 0.4	3.9	5.8	4.5	6.6	1.7	3.82	30.547	. .	30.03
	48	Lacaille 9315 (1st *)	9.0	3	III-VII	85 40 2.0	5.9	8.9	7.2	9.1	2.8	5.98	29.580	. .	29.06
	49	B. A. C. 8045	. .	3	III-VII	98 25 4.0	8.4	9.2	7.8	10.5	4.9	7.47	36.516	. .	36.00
	50	Lacaille 9424	. .	3	V-IX	100 40 2.1	5.8	8.9	7.0	7.8	3.5	5.85	31.762	. .	31.26
	51	Radcliffe 6081	8.0	3	IV-VI	4 40 1.7	4.2	7.8	5.7	5.2	2.0	4.43	26.914	. .	26.3
	52	μ Sculptoris	. .	3	V-IX	91 35 0.5	6.7	7.8	5.4	7.0	1.8	4.87	29.585	. .	29.0
	53	108 Aquarii	. .	3	III-VII	78 25 0.0	5.0	8.2	7.0	7.1	2.4	4.95	26.361	. .	25.8
	54	B. A. C. 8374	. .	3	III-VII	30 30 1.1	4.8	7.6	6.5	7.4	4.2	5.27	26.264	. .	25.7
	55	Nadir	. .	.	. .	199 59 58.3	6.6	3.1	5.3	3.7	2.2	3.20	30.474	30.518	.
Dec. 3	56	Anon. $0^h\ 42^m\ 19^s$	. .	1	IX	18 25 4.1	6.5	5.4	4.0	12.3	6.5	6.93	30.145	30.546	2
	57	Anon. $0^h\ 51^m\ 41^s$	. .	3	III-VII	57 5 . .	9.2	11.3	7.9	15.4	11.6	10.17	34.366	. .	33.
	58	Weisse 89	.	2	VII, IX	58 0 4.1	7.8	8.8	6.3	13.2	12.2	8.73	27.647	. .	27.
	59	Anon. $1^h\ 17^m\ 15^s$	8.0	2	I, IX	20 29 57.6	58.4	62.5	56.0	64.8	59.3	59.77	34.458	. .	33.
	60	Anon. $1^h\ 19^m\ 26^s$	. .	2	III, V	" " "	"	"	"	"	"	"	30.754	. .	30.
	61	B. A. C. 479	6.0	3	III-VII	91 20 8.1	11.3	18.8	7.9	15.2	10.4	11.95	27.585	. .	27
	62	Lalande 3412	7.7	3	III-VII	22 10 0.0	2.6	5.9	1.2	7.3	4.2	3.53	30.295	. .	2
	63	56 Ceti	5.5	3	III-VII	82 0 2.7	5.2	5.1	3.2	8.3	4.8	4.88	32.320	. .	3
	64	B. A. C. 643	5.0	3	III-VII	88 45 2.8	8.2	8.2	5.0	11.7	8.1	7.33	32.562	. .	3
	65	Anon. $2^h\ 9^m\ 26^s$	. .	2	VI, VII	3 35 1.9	5.4	7.7	3.0	10.2	6.5	5.78	29.812	30.546	2

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
30.300	41.0	33.7	+ 40.8	S. 32 55 46.0	39.4	+ 5 57 13.4	− 17.2	Y.	
. .	. .	. .	. .	. . . .	. .	. . .	1 .	Y.	
30.440	42.0	35.3	− 2 1.9	37 3 6.2	46.0	+ 1 49 46.6	26.9	Y.	
. .	. .	. .	− 1 22.7	67 13 43.6	2 24.5	− 28 22 29.3	19.2	Y.	
30.456	41.8	34.4	+ 34.7	47 10 40.9	1 5.9	− 8 18 8.0	24.6	Y.	
. .	. .	. .	− 1 11.1	23 48 54.6	27.0	+ 15 4 17.2	29.8	Y.	
30.454	41.2	34.1	− 58.6	48 54 7.5	1 10.0	− 10 1 38.7	24.3	Y.	
. .	. .	. .	+ 6.4	77 50 11.5	4 37.1	39 1 9.8	18.3	Y.	
30.450	41.0	34.0	41.5	S. 78 0 48.6	4 41.2	− 39 11 51.0	18.4	Y.	
. .	. .	. .	+ 25.7	N. 16 24 28.3	18.0	+ 55 18 25.1	32.1	Y.	
. .	. .	. .	− 2 12.5	N. 16 27 6.5	18.1	+ 55 21 3.4	31.9	Y.	
30.450	40.5	32.8	2 10.4	S. 63 22 54.9	2 1.8	− 24 31 17.9	21.7	Y.	
. .	. .	. .	− 10.9	68 4 58.1	2 31.5	29 13 50.8	21.0	Y.	
30.454	40.0	32.0	+ 1 18 1	61 51 25.2	1 54.3	22 59 40.7	22.0	Y.	
. .	. .	. .	+ 1 21.4	1 46 27.0	1.9	− 37 7 9.9	27.1	Y.	
. .	. .	. .	− 2 26.6	0 22 41.4	0.4	+ 38 30 57.0	26.4	Y.	
. .	. .	. .	2 10.0	S. 0 22 57.9	0.4	38 30 40.5	26.4	X.	
. .	. .	. .	− 2 17.4	N. 7 57 35.8	8.6	46 51 23.2	24.0	Y.	
30.440	40.0	32.1	+ 2 12.3	N. 7 57 40.9	8.6	46 51 28.3	24.0	Y.	
. .	. .	. .	+ 59.7	S. 14 56 4.8	16.4	23 57 17.6	23.1	Y.	
. .	. .	. .	− 59.7	14 54 5.5	16.3	+ 23 59 17.0	23.1	Y.	
. .	. .	. .	11.5	63 49 52.6	2 4.3	− 24 58 18.1	20.9	Y.	
30.440	39.2	31.8	− 1 33.7	70 13 33.5	2 49.3	− 31 22 44.0	20.4	Y.	
. .	. .	. .	+ 2 19.8	21 22 28.6	24.0	+ 17 30 46.2	20.3	Y	
. .	. .	. .	+ 1 30.2	64 31 35.1	2 8.3	− 25 40 4.6	20.1	Y.	
30.450	38.2	31.4	− 1 42.5	69 33 21.9	2 43.6	30 42 26.7	19.8	Y.	
. .	. .	. .	+ 1 51.2	64 51 57.0	2 10.4	− 26 0 28.6	19.5	Y.	
. .	. .	. .	− 1.1	28 10 7.8	32.9	+ 10 42 58.1	17.6	Y.	
. .	. .	. .	+ 1 4.2	0 16 14.1	0.3	38 37 24.4	14.0	Y.	
30.430	38.0	31.2	+ 37.2	32 55 44.1	39.8	5 57 14.9	16.7	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
29.866	52.2	47.5	− 1 34.1	0 58 32.0	1.0	+ 37 55 5.8	34.4	Y.	
. .	. .	. .	1 23.2	71 23 42.5	2 51.6	− 32 32 55.3	12.7	Y.	
29.866	52.0	46.3	− 1 14.9	38 28 52.0	46.4	+ 0 24 0.4	24.3	Y.	
. .	. .	. .	+ 1 3.9	64 11 10.4	2 0.3	− 25 19 31.9	16.2	Y.	
. .	. .	. .	16.5	42 0 18.1	52.6	3 7 31.9	23.8	Y.	
29.866	51.7	45.7	+ 2 47.5	70 12 54.1	2 41.2	− 31 21 56.5	15.5	Y.	
. .	. .	. .	− 1 22.3	S. 2 43 44.3	2.8	+ 36 9 51.7	35.2	Y.	
. .	. .	. .	+ 18.1	N. 1 34 36.6	1.6	+ 40 28 17.0	36.0	Y.	
29.878	51.2	45.6	− 18.8	S. 50 54 44.4	1 12.0	− 12 2 17.6	22.4	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
29.940	37.5	25.3	16.2	52 9 49.1	1 18.7	13 17 29.0	12.3	Y.	
. .	. .	. .	− 49.1	45 59 16.8	1 3.3	7 6 41.3	15.5	Y.	
29.950	37.0	24.8	+ 2 7.2	65 47 14.3	2 15.5	− 26 55 51.0	9.3	Y.	
. .	. .	. .	− 2 39.9	2 7 22.9	2.3	+ 36 46 13.6	30.9	Y.	
. .	. .	. .	12.1	41 4 48.3	53.4	− 2 12 2.9	19.4	Y.	
29.968	36.0	24.2	− • 1.0	53 5 2.9	1 21.6	14 12 45.7	15.8	Y.	
. .	. .	. .	+ 29.2	65 40 35.2	2 15.1	26 49 11.5	12.1	Y.	
29.960	36.0	24.0	− 3 8.2	78 21 59.2	4 50.9	39 33 11.3	8.6	Y.	
. .	. .	. .	− 39.6	S. 80 39 26.3	5 59.4	− 41 51 46.9	8.5	Y.	
29.960									
	35.2	23.7	+ 1 53.1	N. 15 18 2.5	16.8	+ 54 11 58.1	38.2	Y.	
.	. .	. .	1 28.8	S. 71 35 33.6	3 2.9	− 32 44 57.7	12.6	Y.	
. .	. .	. .	2 10.2	58 27 15.1	1 39.8	− 19 35 16.1	17.5	Y.	
29.964	35.0	23.5	2 13.5	S. 10 32 18.8	11.4	+ 28 21 8.6	33.4	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	+ 13.8	N. 1 34 39.2	1.7	40 28 19.7	36.6	Y.	
30.274	40.0	32.1	− 1 59.7	S. 37 3 10.4	46.0	1 49 42.4	26.2	Y.	
. .	. .	. .	+ 1 30.8	38 1 39.6	47.7	0 51 11.5	26.0	Y.	
. .	. .	. .	− 2 1.4	0 27 58.4	0.5	38 25 39.9	35.4	Y.	
. .	. .	. .	− 6.3	0 29 53.4	0.5	+ 38 23 44.9	35.3	Y.	
30.276	39.2	32.1	+ 1 32.6	71 21 44.5	2 59.2	− 32 31 4.9	16.7	Y.	
. .	. .	. .	+ 8.1	2 10 11.6	2.3	+ 36 43 24.9	33.8	Y.	
30.268	39.0	32.9	− 55.7	61 59 9.2	1 54.1	− 23 7 24.5	19.5	Y.	
. .	. .	. .	− 1 3.4	S. 68 44 4.0	2 35.3	− 29 53 0.5	17.9	Y.	
30.260	39.0	32.9	+ 23.4	N. 16 24 30.8	17.9	+ 55 18 27.5	− 34.9	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
1877.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
Dec. 3	1	O. Arg. S. 1547 . .	8.3	3	III–VII	83 25 4.2	7.5	8.1	6.7	10.7	7.2	7.40	34.637	30.546	34.095
	2	Lacaille 792 . . .	7.0	3	III–VII	88 5 3.5	7.6	6.6	5.8	10.3	7.1	6.82	30.643	. .	30.102
	3	Lacaille 873 . . .	. .	3	III–VII	81 50 1.4	3.7	5.1	3.0	7.9	4.1	4.20	27.820	. .	27.278
	4	Anon. 2^h 58^m 17^s .	8.0	3	V–IX	21 45 1.4	3.2	3.8	1.7	7.8	4.1	3.67	27.922	. .	27.360
	5	Weisse (2) 209 . .	8.0	3	III–VII	35 15 2.8	5.7	7.9	1.3	9.1	7.1	5.65	30.558	. .	30.008
	6	Anon. 3^h 28^m 15^s .	. .	1	V	12 0 3.2	7.7	8.5	5.0	12.2	7.6	7.37	26.240	. .	25.694
	7	Anon. 3^h 28^m (30^s) .	. .	1	V	“ “ “	“	“	“	“	“	“	26.232	. .	25.686
	8	Anon. 3^h 39^m 21^s .	8.0	3	III–VII	35 40 4.1	6.7	8.9	5.1	11.2	7.2	7.20	33.551	. .	33.001
	9	Nadir	. .	.	. .	200 0 1.9	5.4	6.1	3.8	8.0	7.1	5.38	30.549	30.546	. .
	10	Lalande 7987. . .	8.0	2	VII, IX	42 35 3.3	7.3	9.1	5.0	10.8	8.1	7.27	29.324	. .	28.769
	11	Lacaille 1449. . .	. .	3	III–VII	94 50 1.0	3.7	5.7	4.4	8.3	4.0	4.52	36.482	. .	35.943
	12	Lacaille 1537. . .	. .	3	V–IX	96 55 4.9	10.6	10.7	9.0	14.8	8.8	9.80	33.647	. .	33.117
	13	Weisse 925 . . .	. .	2	VII, IX	57 35 . .	13.8	13.8	10.2	19.1	15.0	13.32	33.415	. .	32.869
	14	Anon. 4^h 52^m 22^s .	. .	3	III–VII	20 15 3.8	8.2	11.1	7.2	13.3	7.5	8.52	26.749	. .	26.195
	15	Nadir	. .	.	. .	200 0 4.1	6.4	8.4	6.0	10.8	8.7	7.40	30.629	30.546	. .
7	16	39 Aquarii	. .	3	III–VII	73 40 2.3	4.1	7.2	4.2	9.3	6.1	5.53	30.744	30.569	30.178
	17	Lacaille 9119 . .	. .	3	III–VII	98 35 2.4	4.5	5.3	2.8	10.1	4.8	4.98	33.185	. .	32.624
	18	60 Aquarii	. .	3	V–IX	61 5 3.8	5.3	8.4	4.4	11.3	8.0	6.87	31.031	. .	30.463
	19	Lacaille 9315 (1st *).	8.5	3	III–VII	85 40 3.3	5.2	9.4	5.8	11.3	7.9	7.15	29.528	. .	28.964
	20	c^2 Aquarii	. .	3	III–VII	80 40 3.6	5.7	8.2	4.3	10.7	7.8	6.72	26.919	. .	26.354
	21	B. A. C. 8139 . . .	. .	3	V–IX	21 0 0.4	2.3	4.4	2.9	7.2	3.9	3.52	33.543	. .	32.958
	22	75 Pegasi	5.5	3	III–VII	41 10 2.8	4.7	6.8	3.6	10.4	8.1	6.07	31.485	. .	30.913
	23	O. Arg. S. 23059 . .	. .	3	III–VII	87 25 4.9	7.1	8.5	7.4	11 9	8.5	8.05	29.400	. .	28.836
	24	Lacaille 9605 . .	. .	2	VII, IX	“ “ “	“	“	“	“	“	“	34.257	. .	33.705
	25	Lacaille 9673 . .	. .	3	III–VII	101 44 55.0	57.3	58.8	59.0	61.2	56.2	57.92	35.690	. .	35.130
	26	Lalande 47298 . .	8.0	1	IX	22 25 3.3	6.3	8.2	3.9	11.2	6.2	6.52	34.788	. .	34.183
	27	Anon. 0^h 15^m 20^s .	9.0	2	V, VII	14 40 3.0	5.3	8.9	5.2	10.2	4.4	5.83	33.822	. .	33.246
	28	Nadir	. .	.	. .	200 0 1.0	4.8	5.0	3.2	7.7	6.5	4.07	30.569	30.569	. .
8	29	24 Cephei	. .	3	III–VII	347 10 3.7	3.1	7.8	. .	10.5	7.3	5.78	31.599	30.568	31.022
	30	Lacaille 7817 . .	. .	3	III–VII	83 10 4.0	4.8	7.1	5.1	10.5	9.0	6.75	30.901	. .	30.337
	31	Lacaille 9190. . .	7.0	3	III–VII	92 54 58.9	60.6	60.0	59.4	63.5	61.1	60.58	27.189	. .	26.627
	32	Lacaille 9265. . .	6.0	3	III–VII	85 25 2.3	3.1	6.3	2.6	9.5	7.0	5.13	31.271	. .	30.708
	33	Lacaille 9307. . .	6.5	3	III–VII	91 5 0.8	1.8	3.3	2.5	7.2	3.7	3.22	33.299	. .	32.737
	34	Lacaille 9357. . .	. .	3	III–VII	86 20 1.3	1.5	4.2	3.8	7.3	5.3	4.90	31.153	. .	30.590
	35	Lacaille 9414. . .	6.0	3	III–VII	89 25 1.8	1.2	3.4	2.2	8.1	5.8	3.75	36.635	. .	36.073
	36	B. A. C. 8123. . .	6.5	3	V–IX	63 30 1.0	1.1	2.8	0.0	6.9	4.5	2.72	35.103	. .	34.536
	37	Lacaille 9516. . .	7.0	3	III–VII	90 50 0.5	0.8	3.0	0.3	6.6	4.1	2.55	33.003	. .	32.441
	38	Lacaille 9578. . .	. .	3	V–IX	100 10 4.2	4.0	6.3	3.2	10.8	7.1	5.93	30.642	. .	30.092
	39	Lacaille 9620. . .	6.5	3	III–VII	94 14 59.3	59.7	3.0	0.2	7.8	2.8	2.13	35.447	. .	34.886
	40	Lacaille 9699. . .	. .	3	III–VII	97 25 1.2	2.6	3.9	1.9	8.6	5.4	3.93	32.166	. .	31.606
	41	Lalande 47298 . .	. .	3	III–VII	22 25 2.5	4.7	7.2	1.9	11.5	6.9	5.78	34.772	. .	34.197
	42	Radcliffe 73 . . .	7.5	1	V	14 40 3.3	5.5	7.8	3.6	10.8	6.3	6.22	34.930	. .	34.362
	43	Anon. 0^h 15^m 20^s .	9.0	3	V–IX	“ “ “	“	“	“	“	“	“	33.936	. .	33.348
	44	Nadir	. .	.	. .	200 0 1.5	3.7	3.4	1.6	7.2	7.6	4.17	30.552	30.568	. .
10	45	Nadir	. .	.	. .	200 0 2.9	2.4	5.9	0.8	7.2	6.7	4.32	30.562	30.576	. .
	46	24 Cephei	. .	3	IV–VI	347 10 4.8	3.8	9.6	. .	11.6	7.5	6.47	31.645	. .	31.060
	47	Lacaille 7817. . .	. .	3	III–VII	83 10 4.0	4.8	7.8	0.0	9.8	7.4	5.63	30.876	. .	30.304
	48	Lacaille 9205. . .	6.0	3	III–VII	90 10 2.7	4.8	5.9	1.7	8.2	6.0	4.88	33.856	. .	33.286
	49	Lacaille 9265. . .	6.5	3	III–VII	85 25 1.5	3.0	6.4	2.7	8.8	5.4	4.63	31.241	. .	30.670
	50	Lacaille 9307. . .	. .	3	III–VII	91 5 3.0	4.3	5.8	3.9	9.3	6.5	5.42	33.383	. .	32.813
	51	Lacaille 9357. . .	. .	3	III–VII	86 19 59.0	0.0	2.9	0.8	5.3	2.0	1.67	31.092	. .	30.521
	52	Lacaille 9414. . .	. .	3	III–VII	89 25 1.3	2.7	4.9	0.8	7.8	5.0	3.75	36.652	. .	36.082
	53	Lacaille 9458. . .	. .	3	III–VII	90 40 1.9	4.7	6.3	2.0	8.4	5.2	4.75	34.977	. .	34.407
	54	Lacaille 9516. . .	. .	3	III–VII	90 50 0.0	1.6	2.0	59.2	4.7	1.6	1.52	32.942	30.576	32.372
12	55	ζ Aquarii (1st *) . .	. .	3	III–VII	59 30 5.1	3.4	6.8	2.4	13.3	12.6	7.27	28.092	30.572	27.520
	56	Lacaille 9205. . .	6.0	3	III–VII	90 10 2.1	2.2	3.0	1.1	7.3	7.9	3.93	33.816	. .	33.250
	57	Lacaille 9265. . .	. .	3	III–VII	85 25 3.4	3.3	6.4	2.3	10.3	9.2	5.82	31.285	. .	30.718
	58	Lacaille 9307. . .	7.0	3	V–IX	91 5 2.0	1.4	2.0	59.2	7.4	5.8	2.97	33.292	. .	32.733
	59	c^3 Aquarii . . .	5.0	3	III–VII	80 40 2.7	4.0	6.8	2.8	13.4	8.0	6.28	26.876	. .	26.308
	60	Lacaille 9436. . .	7.0	3	III–VII	88 15 2.2	3.7	4.8	0.8	9.2	7.5	4.70	29.282	. .	28.715
	61	Lacaille 9508. . .	. .	3	III–VII	85 20 3.7	4.9	8.3	4.0	13.3	10.8	7.50	37.137	. .	36.570
	62	Lacaille 9539. . .	. .	3	III–VII	84 25 4.2	5.1	8.2	5.2	13.7	10.7	7.85	31.231	. .	30.664
	63	Lacaille 9620. . .	. .	3	III–VII	94 14 59.1	60.0	63.0	60.2	67.8	64.2	62.38	35.397	. .	34.832
	64	Nadir	. .	.	. .	200 0 0.2	0.3	2.1	0.0	6.0	6.7	2.55	30.504	30.572	. .
18	65	η Pegasi.	. .	3	III–VII	29 20 3.3	5.3	8.1	6.5	11.6	8.9	7.28	34.199	30.697	33.497

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 2 8.3	S. 63 21 59.1	2 1.0	− 24 31 21.3	− 19.2	Y.	
. .	. .	. .	− 3.2	68 5 3.6	2 30.5	29 13 55.3	18.2	Y.	
30.254	39.0	31.9	+ 1 25.3	61 51 29.5	1 53.6	− 22 59 44.3	19.4	Y.	
. .	. .	. .	+ 1 22.7	1 46 26.4	1.9	+ 37 7 10.5	28.7	Y.	
. .	. .	. .	− 0.2	S. 15 15 5.4	16.6	23 38 16.8	26.0	Y.	
. .	. .	. .	+ 2 14.9	N. 7 57 37.7	8.5	46 51 25.0	26.4	Y.	
30.260	38.5	31.9	+ 2 15.2	N. 7 57 37.4	8.5	46 51 24.7	26.4	Y.	
. .	. .	. .	− 1 34.0	S. 15 38 33.2	17.1	23 14 48.5	23.5	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	+ 38.6	22 35 45.8	25.5	+ 16 17 27.5	20.0	Y.	
30.254	38.0	30.3	− 3 6.2	74 46 58.3	3 41.7	− 35 57 1.2	16.1	Y.	
. .	. .	. .	1 37.7	76 53 32.1	4 17.7	− 38 4 11.0	15.7	Y.	
. .	. .	. .	− 1 29.9	37 33 43.1	47.1	+ 1 19 8.3	16.5	Y.	
30.246	38.0	30.0	+ 1 59.2	0 17 7.8	0.3	+ 38 36 30.7	15.4	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.200	44.0	37.0	− 5.6	53 40 0.0	1 21.8	− 14 47 43.0	13.0	Y.	
30.204	44.0	36.2	1 22.2	78 33 42.7	4 50.7	39 44 54.6	5.7	Y.	
. .	. .	. .	− 15.5	41 4 51.4	52.6	2 12 5.2	18.8	Y.	
30.190	43.0	35.0	+ 32.5	65 40 39.6	2 13.1	26 49 13.9	11.7	Y.	
. .	. .	. .	+ 1 54.3	60 42 1.0	1 47.5	− 21 50 9.7	14.0	Y.	
. .	. .	. .	− 1 32.7	0 58 30.8	1.0	+ 37 55 57.0	34.4	Y.	
30.190	42.0	33.8	− 28.6	21 9 37.5	23.5	+ 17 43 37.8	29.0	Y.	
. .	. .	. .	+ 36.5	67 25 44.5	2 25.0	− 28 34 30.7	13.7	Y.	
. .	. .	. .	− 1 56.1	67 23 11.9	2 24.7	28 31 57.8	13.7	Y.	
30.186	41.5	33.3	2 40.8	81 42 17.1	6 36.8	− 42 55 15.1	9.8	Y.	
. .	. .	. .	2 11.1	S. 2 22 55.4	2.5	+ 36 30 40.9	35.6	Y.	
. .	. .	. .	1 41.7	N. 5 21 35.9	5.7	44 15 20.4	37.7	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.064	45.2	44.2	32.0	N. 32 50 26.3	38.1	+ 71 44 43.2	35.4	Y.	
. .	. .	. .	− 10.6	S. 63 9 56.2	1 56.3	− 24 18 13.7	10.7	Y.	
30.072	45.0	44.3	+ 1 45.7	72 56 46.3	3 10.4	34 6 17.9	8.2	Y.	
. .	. .	. .	− 22.2	65 24 42.9	2 8.6	26 33 12.7	11.2	Y.	
. .	. .	. .	1 25.8	71 3 37.4	2 50.9	32 12 49.5	9.8	Y.	
30.080	45.0	43.0	18.5	66 19 46.4	2 14.4	27 28 22.0	11.8	Y.	
. .	. .	. .	3 10.3	69 21 53.4	2 36.2	30 30 50.8	11.4	Y.	
. .	. .	. .	2 22.1	43 27 40.6	56.1	4 34 57.9	20.6	Y.	
30.090	45.0	42.9	1 16.5	70 48 46.0	2 48.9	31 57 56.1	11.8	Y.	
. .	. .	. .	2.9	80 10 3.0	5 31.2	41 21 55.4	9.5	Y.	
. .	. .	. .	2 33.1	74 12 29.0	3 28.0	35 22 18.2	13.8	Y.	
30.094	44.5	39.2	50.3	77 24 13.6	4 21.7	− 38 34 56.5	11.1	Y.	
. .	. .	. .	2 11.5	S. 2 22 54.2	2.5	+ 36 30 42.1	35.6	Y.	
. .	. .	. .	2 16.7	N. 5 22 10.5	5.6	44 15 54.9	37.7	Y.	
30.100	43.5	37.0	1 44.9	5 21 38.7	5.6	44 15 23.1	37.7	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.050	42.5	40.5	33.2	N. 32 50 26.8	38.4	+ 71 44 44.0	35.4	Y.	
. .	. .	. .	9.5	S. 63 9 56.1	1 57.2	− 24 18 14.5	10.6	Y.	
30.056	43.0	39.9	1 43.0	70 8 21.9	2 43.6	31 17 26.7	9.2	Y.	
. .	. .	. .	21.0	65 24 43.6	2 9.6	26 33 14.4	11.2	Y.	
. .	. .	. .	1 28.1	71 3 37.3	2 52.1	32 12 50.6	9.8	Y.	
30.060	43.0	39.7	16.3	66 19 45.4	2 15.3	27 28 21.9	11.7	Y.	
. .	. .	. .	3 10.6	69 21 53.1	2 37.1	30 30 51.4	11.3	Y.	
. .	. .	. .	2 18.1	70 37 46.6	2 48.2	31 46 56.0	11.3	Y.	
30.080	43.0	39.8	− 1 14.3	70 48 47.2	2 49.9	31 57 58.3	11.7	Y.	
30.250	49.0	48.8	+ 1 17.8	39 31 25.0	48.6	0 38 34.8	18.8	Y.	
. .	. .	. .	− 1 41.9	70 8 22.1	2 41.7	31 17 25.0	9.2	Y.	
30.256	49.5	48.3	22.6	65 24 43.3	2 8.2	26 33 12.7	11.1	Y.	
. .	. .	. .	− 1 25.7	71 3 37.3	2 50.4	32 12 48.9	9.8	Y.	
. .	. .	. .	+ 1 55.7	60 42 2.0	1 45.0	21 50 8.2	13.8	Y.	
30.240	49.5	46.0	− 40.3	68 15 45.0	2 27.5	29 24 33.7	11.8	Y.	
. .	. .	. .	3 25.9	65 16 41.6	2 8.1	26 25 10.9	13.4	Y.	
. .	. .	. .	20.8	64 24 47.0	2 3.4	25 33 11.6	13.9	Y.	
30.246	49.0	44.2	2 31.4	74 12 30.9	3 27.2	− 35 22 19.3	11.4	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.460	47.0	41.5	− 1 49.6	S. 9 18 17.7	9.9	+ 29 35 11.2	− 29.1	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observ'd.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1877. Dec. 18	1	2 Piscium	. .	3	III-VII	58 35 1.9	5.0	7.7	5.3	10.8	9.4	6.68	32.624	30.697	31.927
	2	Nadir	. .	.	. .	200 0 0.4	2.3	5.3	3.1	7.0	5.1	3.87	30.671	30.697	. .
20	3	Nadir	. .	.	. .	199 59 58.3	55.9	58.8	54.2	62.8	65.9	59.32	30.476	30.645	. .
	4	2 Piscium	. .	3	III-VII	58 35 0.7	0.3	1.2	57.2	9.2	9.1	2.95	32.401	. .	31.756
	5	c^2 Aquarii	. .	3	III-VII	80 45 2.2	0.9	2.9	57.9	9.2	8.5	3.60	36.345	. .	35.704
	6	γ Sculptoris	. .	3	III-VII	92 5 1.2	0.2	1.9	59.6	7.4	7.0	2.88	35.267	. .	34.628
	7	B. A. C. 8172	. .	3	III-VII	95 5 3.9	3.4	6.8	5.3	12.5	10.8	7.12	34.280	. .	33.642
	8	Lacaille 9539	. .	3	V-IX	84 25 1.4	0.0	1.8	59.3	8.2	7.1	2.97	31.087	. .	30.452
	9	Lacaille 9605	. .	3	III, V, IX	87 24 59.4	58.8	59.2	57.1	65.8	65.3	60.93	33.932	. .	33.298
	10	Lacaille 9680	. .	3	III-VII	84 10 0.3	59.3	2.1	57.0	7.2	6.8	2.12	28.431	. .	27.791
	11	Lacaille 78	. .	3	III-VII	90 15 0.7	59.1	59.8	57.1	5.6	5.2	1.25	34.642	30.645	34.003
31	12	Lacaille 9655	. .	3	III-VII	84 15 1.5	2.3	4.4	2.9	6.7	4.3	3.68	27.380	30.561	26.824
	13	B. A. C. 23	6.0	3	III-VII	87 20 3.2	4.3	6.8	5.7	8.6	8.2	6.13	30.427	. .	29.871
	14	Lacaille 83	. .	3	III-VII	87 15 1.2	1.7	4.8	4.7	5.2	5.3	3.82	31.597	. .	31.041
	15	Anon. $0^h 42^m 32^s$	7.5	3	III-VII	18 30 2.9	5.0	7.2	6.8	6.8	4.0	5.45	33.854	. .	33.285
	16	γ Andromedæ	. .	2	VII, IX	" " "	"	"	"	"	"	"	33.516	. .	32.928
	17	Anon. $0^h 52^m 0^s$	. .	2	VII, IX	22 20 2.8	6.3	6.7	8.0	7.8	7.1	6.45	28.441	. .	27.857
	18	Nadir	. .	.	. .	200 0 2.9	7.3	8.0	7.3	6.7	8.7	6.82	30.629	30.561	. .

Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1877.0.	Observer.	REMARKS.
	At.	Ex.							
in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
. .	. .	. .	− 1 0.4	S. 38 34 6.3	48.0	+ 0 18 44.5	− 20.6	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
30.266	55.8	60.5	53.0	38 34 9.9	45.9	+ 0 18 43.0	20.5	Y.	
. .	. .	. .	2 58.8	60 42 4.8	1 42.5	− 21 50 8.5	13.5	Y.	
30.280	56.0	58.3	2 25.0	72 2 37.8	2 56.6	33 11 55.6	10.4	Y.	
. .	. .	. .	1 54.1	75 3 13.0	3 33.6	36 13 7.8	9.9	Y.	
30.286	56.0	57.2	14.1	64 24 48.8	2 0.5	25 33 10.5	13.5	Y.	
. .	. .	. .	− 1 43.4	67 23 17.6	2 18.3	28 31 57.1	13.0	Y.	
30.294	56.2	57.2	+ 1 9.2	64 11 11.3	1 59.3	25 19 31.8	14.6	Y.	
30.295	56.3	55.3	− 2 5.4	70 12 55.8	2 40.4	31 21 57.4	13.3	Y.	
29.632	44.0	35.5	+ 1 39.5	64 16 43.2	2 2.5	25 25 6.9	14.0	Y.	
29.642	43.5	35.6	+ 4.0	67 20 10.2	2 21.1	28 28 52.5	13.4	Y.	
. .	. .	. .	− 32.6	S. 67 14 31.2	2 20.5	− 28 23 12.9	13.8	Y.	
. .	. .	. .	1 43.0	N. 1 31 37.5	1.6	+ 40 25 17.9	37.2	Y.	
29.650	42.2	35.2	− 1 31.7	N. 1 31 26.3	1.6	40 25 6.7	37.2	Y.	
. .	. .	. .	+ 1 7.1	S. 2 21 13.6	2.4	+ 36 32 22.8	− 36.1	Y.	
. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	

OBSERVATIONS

WITH THE

XVI-INCH EQUATORIAL.

1877.

OBSERVATIONS

MADE WITH

THE XXVI-INCH EQUATORIAL.

Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
						Ver. I.	Ver. II.				
	°	h. m.	r.	r.	h. m.	°	°				
Saturn, white spot .	..	. .	. .	. .	. .	. .	. .	3 A	2	H.	The spot faint to-night and indistinct, and the images are poor at this altitude. The spot in center of disk at 7^h 9^m.
Saturn, white spot .	..	. .	. .	. .	. .	. .	. .	.	.	H.	Bad images, and the spot so faint and indistinct that no observation was made.
Satellite of Neptune.	20	7 4	62.986	65.300	6 51	89.8	. .	6 A	2	H.	Blazing image of planet. Parallel, 17°.8. Chron. corr. + 1^m.7.
Procyon, Comp. I .	0	. .	. .	. .	11 50	101.7	. .	2 A	1	Hn.	Air very transparent but images very unsteady; eye-piece 400 could not be used. On examining Procyon saw two near companions as in sketch, and began with measure of I.
Procyon II . . .	° ° 26–36	. .	. .	. .	. .	. .	. .	.	.	Hn.	After the first measure of II the sky only clear by intervals and the two last measures taken in clear spaces. Estimated No. to be from 20° to 30° more position angle than I.
Procyon III . . .	..	. .	. .	. .	12 5 12 45	57.2 232.0	. . . .	2 A 2 A	. .	Hn. Hn.	Set approximately on the first companion that I could certainly see in a clear space, and it was certainly of greater position angle than II. This is only a rough measure, as it became again overcast before I could satisfy myself.
Procyon, Comp. II (?)	..	. .	. .	. .	12 40	243.8	. .	.	.	Hn.	Air clear but images not so steady as before, and eye fatigued.
Satellite of Neptune.	60	6 24	62.989	65.261	6 11	67.6	. .	6 A	3	H.	Satellite faint.
107 Arietis. . . .	10	. .	63.828	64.454	3.3	110.2	. .	3 A	2	H.	Driving clock not running well. Parallel, 36°.8. Chron. corr. + 2^m.5
107 Arietis. . . .	15	. .	63.805	64.407	2.4	107.5	. .	3 A	3	H.	
Satellite of Neptune.	30	6 27	62.505	65.795	6 17	88.1	. .	6 A	3	H.	Faint; parallel by Neptune, 33°.4. Chron. corr. + 2^m.5.
246–335* Orionis .	..	5 52	38.166	. .	. .	. .	. .	400	1	Hn.	T = 31°.0. *The numbers are from Bond's Catalogue of Stars in the nebula of *Orion*. Annals H. C. O., vol. v.
335–449 Orionis . .	..	5 56	40.789								
449–554 Orionis . .	..	6 4	56.171	. .	9 30	. .	. .	400	1	Hn.	B = 30^{in}.25; T = 28°.8; t = 67°.0.
554–638 Orionis . .	..	6 14	43.286	93.938	(*)	. .	. .	400	1	Hn.	T = 28°.5. *Coincidence.
638–852 Orionis . .	..	6 26	46.066	. .	. .	. .	. .	.	2		

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m.	r.	r.	h. m.	°	°				
Jan. 26	170–246 Orionis . .	. .	6 43	39.515	. .	. .	. .	. .	400	1	Hn.	T = 29°.0. These measures made for deter tion of the value of microm'r s
	c¹ Orionis	. .	6 58	59.491					400	1	Hn.	
	170 and ι Orionis. .	. .	7 11	39.710	. .	. .	. .	. .	400	1	Hn.	
27	65 Piscium . . .	120	. .	63.676	64.575	2.7	185.2	. .	3 A	3	H.	
	ι Trianguli . . .	80	. .	63.758	64.187	3.2	226.5	. .	3 A	3	H.	
	170 and ι Orionis. .	. .	5 10	39.607	. .	. .	. .	. .	2 A	3	Hn.	T = 40°.0.
	852 and c Orionis. .	. .	5 24	59.505	. .	. .	. .	. .	2 A	3	Hn.	
	170–246 Orionis . .	. .	5 37	39.462	. .	. .	. .	. .	2 A	.	Hn.	
	246–335 Orionis . .	. .	5 46	38.225	93.845	(*)	. .	. .	2 A	3	Hn.	*Coincidence.
	335–449 Orionis . .	. .	5 58	40.893	. .	. .	. .	. .	2 A	3	Hn.	
	449–554 Orionis . .	. .	6 7	56.203	. .	. .	. .	. .	2 A	3	Hn.	
	554–638 Orionis . .	. .	6 18	43.263	. .	. .	. .	. .	2 A	3	Hn.	
	638–852 Orionis . .	. .	6 29	46.103	. .	. .	. .	. .	2 A	3	Hn.	T = 38°.5.
28	ι Trianguli	80	. .	63.738	64.495	2.4	228.8	. .	3 A	3	H.	
	Satellite of NEPTUNE .	230	6 24	63.007	65.295	6 13	247.7	. .	6 A	2	H.	Satellite extremely faint. Chron. corr. + $2^{\rm m}.6$.
29	ι Trianguli . . .	80	. .	63.701	64.504	2.4	225.7	. .	3 A	2	H.	Images much blurred.
	Satellite of NEPTUNE .	220	6 28	62.571	65.697	6 14	269.9	. .	6 A	2	H.	Satellite extremely faint. Chron. corr. + $2^{\rm m}.6$.
30	ι Trianguli . . .	80	. .	63.754	64.498	2.4	225.8	. .	3 A	3	H.	
	65 Piscium . . .	120	. .	63.660	64.580	2.7	188.0	. .	3 A	2	H.	
	201 Piscium . . .	90	. .	64.057	64.166	3.0	199.8	. .	6 A	3	H.	
	θ¹ Orionis, A and B .	320	. .	62.772	65.415	3.3	172.3	. .	3 A	3	H.	
	θ¹ Orionis, A and C .	350	. .	62.397	65.808	. .	141.3	. .	3 A	2	H.	
	θ¹ Orionis, A and D .	75	. .	62.756	65.477	. .	63.0	. .	3 A	2	H.	
	θ¹ Orionis, A and *a* .	140	. .	63.686	64.520	. .	184.2	. .	3 A	2	H.	
	θ¹ Orionis, B and *b* .	0	. .	63.702	64.527	4.4	131.7	. .	3 A	2	H.	
	c¹ Orionis and 852 .	. .	4 54	59.477	. .	. .	. .	. .	2 A	4	Hn.	T = 41°.5.
	ι Orionis and 170. .	. .	5 10	39.612	93.857	(*)	. .	. .	2 A	4	Hn.	*Coincidence.
	170–246 Orionis . .	. .	5 25	39.495	. .	. .	. .	. .	2 A	4	Hn.	
	246–335 Orionis . .	. .	5 34	38.197	. .	. .	. .	. .	2 A	4	Hn.	
	335–449 Orionis . .	. .	5 43	40.827	. .	. .	. .	. .	2 A	4	Hn.	
	449–554 Orionis . .	. .	5 50	56.199	. .	. .	. .	. .	2 A	4	Hn.	T = 39°.0.
	554–638 Orionis . .	. .	5 59	43.270	93.855	(*)	. .	. .	2 A	4	Hn.	T = 37°.0. *Coincidence.
	638–852 Orionis . .	. .	6 8	46.169	. .	. .	. .	. .	2 A	4	Hn.	
	Companion of *Sirius*	60	. .	. .	. .	6.5	70.9	. .	3 A	1	Hn.	Parallel, 33°.4. By waiting for quieter imag measures of *p* were made bright field. No good me of *s* could be made.
Feb. 1	201 Piscium . . .	100	. .	64.058	64.179	2.7	198.7	. .	6 A	3	H.	
	Satellite of NEPTUNE .	35	6 30	62.518	65.717	6 16	270.8	. .	6 A	3	H.	Chron. corr. + $2^{\rm m}.8$.
	θ¹ Orionis, A and B .	310	. .	62.777	65.388	3.7	172.8	. .	3 A	2	H.	

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
77.		°	h. m.	r.	r.	h. m.	°	°				
b. 1	θ^1 Orionis, A and C .	340	. .	62.412	65.786	. .	140.9	. .	3 A	2	H.	
	θ^1 Orionis, A and D .	60	. .	62.726	65.439	4.5	62.1	. .	3 A	2	H.	
3	Satellite of NEPTUNE .	225	7 1	62.847	65.426	6 50	74.4	. .	6 A	2	H.	Satellite very faint. Chron. corr. + $2^{m}.9$.
	G. C. 1519 . . . . *h*. 444. H II 316.	. .	. .	61.002	64.137	. .	248.1	. .	3 A	2	Hn.	Setting, 345°.8, instead of 338°.1.
	Small star between the components.	. .	. .	62.540	64.137	. .	. .	. .	400	2	Hn.	Double nebula: the south component the brighter, and this has a stellar nucleus; the north component is diffused, with no nucleus, and only v. g. B. M. A small star is on the line joining the two, perhaps slightly preceding that line.
5	G. C. 1519 . . . . H II 316.	. .	9 20	60.966	64.130	9.0	66.0	. .	2 A	3	Hn.	Whole sky at 9^h 20^m becomes suddenly cloudy, and so remains. The position-angle of this night is much better than that of February 3, on account of the inconvenient position in which the former was observed. Around the nebula is a darker nearly circular space, perhaps 2′ in diameter; beyond this the ground of the heavens is nebulous. From the nebula itself two faint wisps cross this circular space towards the north. Sky not clear long enough to verify these.
6	γ^2 Andromedæ . .	95	. .	64.073	64.144	. .	206.1	. .	6 A	3	H.	
	Satellite of NEPTUNE .	45	6 32	62.738	65.503	6 23	253.2	. .	6 A	3	H.	Satellite faint. Chron. corr. + $3^{m}.0$.
	θ^1 Orionis, A and B .	. .	. .	62.769	65.414	4.0	172.2	. .	3 A	3	H.	
	θ^1 Orionis, A and C .	. .	. .	62.614	65.790	. .	141.2	. .	3 A	3	H.	
	θ^1 Orionis, A and D .	. .	. .	62.742	65.410	. .	62.0	. .	3 A	3	H.	
	θ^1 Orionis, A and *a* .	. .	. .	63.964	64.490	. .	182.2	. .	3 A	3	H.	
	θ^1 Orionis, B and *b* .	. .	. .	63.660	64.522	4.9	131.1	. .	3 A	2	H.	
	45 Orionis	160	. .	64.107	66.008	10	314.7	. .	400	. .	Hn.	
	45 Orionis	20	. .	. .	. .	10 20	268.5	. .	400	. .	Hn.	A little greater distance than the preceding ones. From 8^h 40^m to 10^h 10^m seeing growing worse. After that not fit for micrometer measurements.
7	*Atlas* and *Pleione* . .	. .	. .	33.904	33.921	. .	. .	. .	3 A	3	H.	Coincidence, $64^r.108$; T = 49°.0. Zodiacal light well seen at 7¼ o'clock. Can trace it up to the Pleiades.
	Companion of *Sirius*	. .	. .	. .	. .	. .	69.1	. .	2 A	1	Hn.	Images extremely poor.
8	γ^2 Andromedæ . .	100	. .	64.074	64.150	. .	202.4	. .	6 A	2	H.	
	θ^1 Orionis, A and B .	. .	. .	62.788	65.445	. .	173.0	. .	3 A	2	H.	
	θ^1 Orionis, A and C .	. .	. .	62.390	65.796	. .	140.9	. .	3 A	2	H.	
	θ^1 Orionis, A and D .	. .	. .	62.712	65.470	. .	62.2	. .	3 A	2	H.	At 7^h 20^m zodiacal light quite bright. The axis of the cone of light passes between α and β Arietis and the Pleiades.
9	γ^2 Andromedæ . .	100	. .	64.073	64.148	3.1	199.8	. .	6 A	2	H.	
	θ^1 Orionis, A and *a* .	. .	. .	63.668	64.480	. .	181.5	. .	3 A	3	H.	
	θ^1 Orionis, B and *b* .	. .	. .	63.684	64.530	. .	133.2	. .	3 A	3	H.	
	θ^1 Orionis, A and B .	. .	. .	62.754	65.390	. .	172.6	. .	3 A	3	H.	
	θ^1 Orionis, A and C .	. .	. .	62.399	65.784	. .	140.9	. .	3 A	2	H.	

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. Feb. 9	θ^1 Orionis, A and D .	. .	. .	62.746	65.466	. .	62.6	. .	3 A	3	H.	
10	γ^2 Andromedæ . .	100	. .	64.073	64.148	3.5	199.4	. .	6 A	3	H.	
	Σ 228	300	. .	64.049	64.157	3.8	170.6	. .	6 A	3	H.	
	θ^1 Orionis, A and *a* .	. .	. .	63.706	64.483	4.2	182.3	. .	3 A	3	H.	
	θ^1 Orionis, B and *b* .	. .	. .	63.675	64.528	. .	132.0	. .	3 A	3	H.	
	θ^1 Orionis, A and B .	. .	. .	62.751	65.422	. .	171.9	. .	3 A	3	H.	
	θ^1 Orionis, A and C .	. .	. .	62.420	65.782	. .	140.0	. .	3 A	3	H	
	θ^1 Orionis, A and D .	. .	. .	62.782	65.471	5.0	61.3	. .	3 A	3	H.	Parallel = 33°.0.
	β Leporis	280	. .	63.766	64.411	5.5	19.0	. .	3 A	3	H	
11	γ^2 Andromedæ . .	100	. .	64.062	64.148	3.6	200.5	. .	6 A	2	H.	
	Σ 228	300	. .	64.057	64.164	3.9	169.8	. .	6 A	2	H.	
	θ^1 Orionis, C and *a* .	170	. .	62.095	66.104	4.1	148.3	. .	3 A	3	H.	
	θ^1 Orionis, C and B .	220	. .	63.235	64.998	. .	89.0	. .	3 A	3	H.	
	θ^1 Orionis, C and *b* .	260	. .	63.497	64.735	. .	64.1	. .	3 A	3	H.	
	θ^1 Orionis, C and D .	120	. .	62.153	66.054	5.1	184.9	. .	3 A	3	H.	Parallel, 33°.7.
	β Leporis	280	. .	63.781	64.426	5.3	17.6	. .	3 A	2	H.	
14	Σ 228	300	. .	64.048	64.157	3.6	165.5	. .	6 A	2	H.	
	θ^1 Orionis, C and B .	215	. .	63.251	65.000	4.0	270.1	. .	3 A	2	H.	
	θ^1 Orionis, C and *b* .	240	. .	63.480	64.743	4.3	242.7	. .	3 A	2	H.	Images very bad. Parallel, 213°.2.
15	Σ 228	310	. .	64.051	64.162	3.7	172.9	. .	6 A	3	H.	
	θ^1 Orionis, C and *a* .	. .	. .	62.106	66.118	3.9	328.2	. .	3 A	3	H.	
	θ^1 Orionis, C and B .	. .	. .	63.230	64.997	. .	268.7	. .	3 A	3	H.	
	θ^1 Orionis, C and D .	. .	. .	62.124	66.053	. .	4.1	. .	3 A	3	H.	
	θ^1 Orionis, C and *b* .	. .	. .	63.482	64.754	. .	242.8	. .	3 A	3	H.	
	θ^1 Orionis, B and D .	100	. .	61.938	66.285	5.0	207.7	. .	3 A	3	H.	Parallel, 213°.2.
	β Leporis	280	. .	63.807	64.425	5.3	198.5	. .	3 A	3	H.	
	Sirius	120	. .	57.027	64.110	. .	188.2	. .	400	2	H.	Distance uncertain. A faint panion 13th mag.
28	θ^1 Orionis, C and A .	. .	. .	62.420	65.798	5.1	143.3	. .	3 A	3	H.	
	θ^1 Orionis, C and B .	. .	. .	62.231	64.996	. .	93.4	. .	3 A	2	H.	
	θ^1 Orionis, C and D .	. .	. .	62.138	66.066	. .	6.6	. .	3 A	3	H.	
	θ^1 Orionis, B and D .	. .	. .	61.942	66.261	. .	30.5	. .	3 A	3	H.	
	θ^1 Orionis, C and *a* .	. .	. .	62.074	66.118	. .	151.1	. .	3 A	2	H.	Parallel, 35°.9.
	θ^1 Orionis, C and *b* .	. .	. .	63.509	64.748	6.3	65.8	. .	3 A	2	H.	
	Sirius	110	. .	56.862	64.108	6.8	11.0	. .	3 A	2	H.	Single distance. Small distant c 13th mag. This is the ne companion outside of the companion. Halo of *Siriu* tends 2′.
Mar. 3	θ^1 Orionis, C and B .	. .	. .	63.234	65.012	5.2	93.6	. .	3 A	3	H.	
	θ^1 Orionis, C and D .	. .	. .	62.161	66.074	. .	186.6	. .	3 A	2	H.	
	θ^1 Orionis, B and D .	. .	. .	61.928	66.302	6.1	30.2	. .	3 A	2	H.	

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
ar. 3	*Sirius*	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	Images fair. The faint companion observed Feb. 28 easily seen. It is the nearest companion except the Clark companion.
	PROCYON	. .	7.0	. .	. .	. .	. .	. .	3 A & 400	.	H.	Images pretty steady, but sky not very clear. Can see no companion but the one distant 42″.
	Sirius	. .	7.8	62.951	65.286	. .	. .	. .	400	2	Hn.	Setting, 343°.1.
5	*Sirius*	. .	. .	62.925	65.255	7.4	73.5	. .	400	3	Hn.	Setting, 343°.6.
7	θ¹ Orionis, C and *b* .	. .	. .	. .	. .	6.4	66.3	. .	3 A	4	H.	Clouds.
10	θ¹ Orionis, C and *b* .	. .	. .	63.491	64.748	5.9	65.1	. .	3 A	3	H.	
	θ¹ Orionis, C and *a* .	. .	. .	62.110	66.118	. .	151.0	. .	3 A	3	H.	
	θ¹ Orionis, C and B .	. .	. .	63.224	64.989	. .	92.6	. .	3 A	2	H.	
	θ¹ Orionis, C and D .	. .	. .	62.143	66.056	. .	6.8	. .	3 A	2	H.	
	θ¹ Orionis, B and D .	. .	. .	61.936	66.306	7.1	30.5	. .	3 A	2	H.	T = 30°.0.
	Sirius	. .	. .	. .	. .	. .	. .	. .	3 A & 2 A	.	H.	Images unsteady, but the Clark companion well seen with both powers. The companion of 13th mag. observed Feb. 28; also seen, but no other nearer than this.
	TITANIA	340	10 46	62.190	66.032	10 19	338.0	. .	6 A	2	Hn.	
	OBERON	15	10 59	59.503	68.788	10 34	296.7	. .	6 A	2	Hn.	Chron. corr. + 4^m 53^s.
15	θ¹ Orionis, B and D .	. .	. .	61.933	66.289	6.1	30.4	. .	3 A	2	H.	
	θ¹ Orionis, C and D .	. .	. .	62.154	66.056	. .	6.5	. .	3 A	2	H.	
	θ¹ Orionis, C and B .	. .	. .	63.266	64.989	. .	92.9	. .	3 A	2	H.	
	θ¹ Orionis, C and A .	. .	. .	62.414	65.805	7.0	143.5	. .	3 A	2	H.	At $7^h.5$ the zodiacal light reaches to within about 5° of the Pleiades.
	OBERON	. .	10 19	60.527	67.702	10 0	93.8	. .	6 A	2	Hn.	
	TITANIA	. .	. .	. .	. .	10 34	31.0	. .	6 A	2	Hn.	OBERON quite faint, although so distant. TITANIA very faint and images quite unsteady. Chron. corr. + $5^m.2$.
	G. C. 2102 = H IV, 27 and *a*.	120	. .	33.602	. .	11	12.4	. .	2 A	2	Hn.	
	H IV, 37 and *b* . .	180	. .	. .	. .	. .	313.3	. .	. .	1	Hn.	Seeing growing worse; distance about half that of star *a*. While observing this nebula, 3 small meteors crossed the field from south toward north:— No. 1, p = about 20°, white, mag. approximately, 10–11. No. 2, p = about 45°, yellowish red, mag. approximately, 8–9. No. 3, p = about 10°, white, mag. approximately, 11.
20	**θ¹ Orionis, C and *b*** .	. .	. .	63.483	64.727	6.5	67.9	. .	3 A	2	H.	
	θ¹ Orionis, C and *a* .	. .	. .	62.123	66.088	. .	151.7	. .	3 A	2	H.	
	θ¹ Orionis, C and B .	. .	. .	63.234	64.977	. .	92.8	. .	3 A	2	H.	
	θ¹ Orionis, C and D .	. .	. .	62.171	66.073	. .	6.6	. .	3 A	2	H.	
	θ¹ Orionis, B and D .	. .	. .	61.924	66.290	7.5	30.4	. .	3 A	2	H.	
	Companion of *Sirius*	. .	. .	63.021	65.198	7.7	74.0	. .	400	2	Hn.	Air hazy at beginning and growing worse rapidly, so as to cut off the light of the companion entirely at the last.

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m. s.	r.	r.	m. s.	°	°				
Mar. 23	Polaris. . . .	. .	0 3 8	55.050	74.419	Δt=9 25	117.8	. .	2 A	3	Hn.	Parallel, 30°.9. Chron. corr. + 45^s. Hour circle = $10^h\ 56^m$.
	Polaris.	. .	0 15 0	54.565	71.767	Δt=8 4	. .	. .	2 A	3	Hn.	Hour circle = $11^h\ 8^m$.
	Polaris.	. .	0 25 11	53.570	72.761	Δt=8 56	. .	. .	2 A	3	Hn.	T = 57°.0. Hour circle = $11^h\ 18^m$. Value of 1 rev. = 9″.956.
	Zero	. .	. .	64.0865	64.1370	. .	. .	. .	6 A	.	Hn.	Telescope west and pointed to the pole; micrometer head above; screw acting against gravity.
	Zero	. .	. .	64.0820	64.1385	. .	. .	. .	6 A	.	Hn.	Telescope west and pointed to the pole; micrometer head below; screw acting with gravity. Head above thickness of wire = .051, .049, .049, .053; mean, 0.0505. Head below thickness of wire = .055, .056, .056, .059; mean, 0.0565. Difference = 0^r.006.
	Companion of *Sirius*	50	. .	63.014	65.224	h. 6.7	67.1	. .	5 A	2	H.	Parallel, 30°.9.
	PROCYON	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	Clouds; the sky hazy. No companion seen but the distant one. Image of PROCYON steady.
24	Polaris.	. .	m. s. Δt=9 29	55.000	75.000	. .	. .	. .	2 A	3	Hn.	T = 65°.7. Hour circle, $11^h\ 34^m$.
	Polaris.	. .	Δt=9 27	55.000	75.000	. .	. .	. .	2 A	3	Hn.	Hour circle, $11^h\ 45^m$.
	Polaris.	. .	Δt=9 26	55.000	75.000	. .	. .	. .	2 A	3	Hn.	Hour circle, $11^h\ 56^m$.
	Polaris.	. .	Δt=9 28.5	55.000	75.000	. .	. .	. .	400	3	Hn.	Hour circle, $12^h\ 9^m$. T = 67°.9. 1 rev. = 9″.974.
29	*Sirius*	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	Very high wind, and image too poor for measurements. The small star in p = 115°, s = 72″, is very well seen. The star of 10th mag. in p = 150°.0; s = 2′ has a companion of 14th mag. a little south following.
	PROCYON	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	Images poor, and the distant companion very faint.
	TITANIA	220	h. m. 9 40	64.111	66.592	h. m. 8 53	81.9	. .	6 A	1	Hn.	
	OBERON	210	9 27	60.054	68.259	9 6	96.6	. .	6 A	1	Hn.	Images diffused and unsteady.
30	Companion of *Sirius*	. .	. .	62.978	65.249	7 46	68.1	. .	400	3 & 2	Hn.	
	TITANIA	190	9 30	64.111	67.510	9 12	107.8	. .	6 A	.	Hn	Chron. corr. + 0^m.8,
	OBERON	. .	. .	. .	. .	. .	. .	. .	. .	.	.	The position angle of OBERON is very nearly the same as that of TITANIA, and with the unsteady images, it cannot be measured.
	UMBRIEL	. .	9 15	. .	. .	. .	. .	. .	. .	.	.	UMBRIEL just seen in a little less position angle than that of TITANIA, perhaps 5° ± less.
	OBERON	. .	9 28	64.111	68.707	. .	. .	. .	6 A	.	Hn.	Seeing very much worse after $0^h\ 33^m$, and measures after that very bad.
	Companion of *Sirius*	50	. .	63.016	65.202	7.5	67.6	. .	5 A	2	H.	Images blazing.
	56 Aurigæ	0	. .	59.253	68.992	8.2	279.92	99.86	5 A	2	H.	Sky hazy; parallel, 210°.93.
April 5	Companion of *Sirius*	50	. .	63.001	65.206	7.9	67.6	. .	5 A	2	H.	
	PROCYON	. .	8.2	. .	. .	. .	. .	. .	5 A	.	H.	Images diffuse, and none of the faint companions seen.

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
877. pril 5	56 Aurigæ	20	. .	59.251	68.958	8.5	99.69	. .	3 A	3	H.	
	Σ 1321	80	. .	62.138	66.067	9.0	242.00	. .	3 A	3	H.	
	7 Leonis	90	. .	59.968	68.267	9.4	41.50	. .	3 A	2	H.	
	ARIEL	210	. .	. . .	. . .	9.7	281.6	. .	6 A	1	Hn.	Hardly better than an estimate.
	UMBRIEL	30	. .	. . .	. . .	9 15	282.6	. .	6 A	3	Hn.	Increasing fog prevents measure of distance.
	OBERON	30	10 1	59.919	68.446	9 29	280.8	. .	6 A	4	Hn.	After 10^h 5^m sky quite foggy, images very steady but faint. Chron. corr.—2^m 0^s.
	TITANIA	350	. .	. . .	. . .	. .	144.8	. .	6 A	4	Hn.	Sky foggy.
6	Polaris	. .	m. s. Δt=10 22.5	55.000	77.000	. .	. .	. .	2 A	1	Hn.	Windy; T = 57°.0. Hour circle, 1^h 1^m; setting 120°.9.
	Polaris	. .	Δt=10 33	55.000	77.000	. .	. .	. .	2 A	1	Hn.	Hour circle, 1^h 15^m; T=57°.0.
	Polaris	. .	Δt=10 22	55.000	77.000	. .	. .	. .	2 A	1	Hn.	T=57°.8; hour circle, 1^h 27^m.
	Polaris	. .	Δt=10 4.5	55.000	77.000	. .	. .	. .	2 A	1	Hn.	T=59°.0; hour circle, 1^h 39^m; clock corr.= + 39^s.4.
	Companion of *Sirius* .	50	. .	62.998	65.197	8.0	67.8	. .	5 A	2	H.	Comp. faint; thin clouds.
	56 Aurigæ	20	. .	59.259	68.961	8.6	99.82	. .	3 A	3	H.	
	Σ 1321	60	. .	61.135	66.085	9.0	241.92	. .	3 A	4	H.	Thin clouds.
7	Companion of *Sirius* .	50	. .	63.003	65.213	8.0	67.5	. .	5 A	5	H.	All my measurements this year made with power 5 A. I think the comp. is fainter this year than in 1874, 1875, and 1876. Have looked with powers 3 A and 5 A.
	7 Leonis	80	. .	59.968	68.245	8.4	41.40	. .	3 A	3	H.	
	Σ 1321	60	. .	62.150	66.078	8.8	241.52	. .	3 A	3	H.	
	Σ 1169	30	. .	61.999	66.215	9.4	109.75	. .	3 A	2	H.	
	56 Aurigæ	20	. .	59.258	69.011	9.7	99.89	. .	3 A	2	H.	
11	56 Aurigæ	20	. .	59.235	68.983	8.4	99.01	. .	5 A	3	H.	
	Σ 1169	10	. .	62.007	66.227	8.8	108.86	. .	5 A	2	H.	
	Σ 1321	60	. .	62.111	66.077	9.2	61.30	. .	3 A	3	H.	
11	PROCYON	. .	. .	. . .	. . .	. .	. . .	. .	. .	.	.	Unsatisfactory vision; the close companion (?) seen only at the better moments, and then with considerable difficulty. examined only the n. f. quadrants nearer p = 12° ± s = 8″ ± farther p = 32°.0 s = 10″ —TODD. Examined PROCYON saw no near companions.—NEWCOMB. Examined PROCYON carefully, and could see nothing of any close companion.—PAUL.
			8 50	. . .	. . .	. .	. . .	. .	. .	.	.	The seeing is bad. The image of PROCYON blurring, and only quiet enough to see well at long intervals. During these I believe I saw one of the faint companions and put a wire upon it; position circle, 242°.9 parallel, 20°.2, determined subsequently); p = 57°.3. Another 10°–15°

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. Apr. 11	Procyon—Continued	. .	. .	. .	. .	. .	. .	. .	.	.	.	less position angle was also seen. The distant companion was kept out of mind in making these observations. The night is not steady enough for a decisive test.—Holden.
	7 Leonis	70	. .	59.975	68.267	10.6	220.38	. .	3 A	3	H.	Parallel, 210°.20.
	Comet b and a star .	180	. .	. .	. .	h. m. s. 18 17 29.7	130.0	. .	2 A	.	Hn.	Parallel, 215°.3.
12	Σ 1169	10	. .	62.014	66.214	9.5	106.82	. .	5 A	2	H.	
	56 Aurigæ	20	. .	. .	. .	9.8	97.11	. .	5 A	1	H.	A gale coming up and images became very bad. Images very unsteady. Parallel, 208°.40.
14	56 Aurigæ	20	. .	59.265	68.967	8.7	96.91	. .	5 A	2	H.	
	Σ 1169	10	. .	62.010	66.203	9.2	107.38	. .	5 A	2	H.	
	Σ 1321	60	. .	62.114	66.080	9.5	59.28	. .	3 A	2	H.	
	Σ 1350	75	. .	63.044	65.161	9.9	51.35	. .	3 A	3	H.	
	7 Leonis	80	. .	59.975	68.267	10.4	218.50	. .	5 A	3	H.	
	Lalande 18231 (Br.) .	70	. .	. .	. .	. .	226.8	. .	3 A	2	H.	Parallel, 208°.40. Images too poor for observation. The above is only an estimation.
17	56 Aurigæ	20	. .	59.235	68.933	9.8	97.19	. .	3 A	3	H.	
	7 Leonis	80	. .	59.964	68.270	10.2	218.65	. .	3 A	3	H.	
	Lalande 18231 . .	75	. .	63.912	64.306	10.6	231.3	. .	3 A	3	H.	Mags., 9.5 and 10.5. Clouds.
20	Occultation of Uranus	. .	. .	. .	. .	. .	. .	. .	2 A	.	.	Observed disappearance at $14^h\ 32^m\ 12^s.2$ Clock time $= 14^h\ 32^m\ 34^s.3$ Washington Sid. Time. Clock corr. $+22^s.1$. The light gradually disappeared, but the seeing was extremely bad, and the first contact could not be distinguished. Emersion of Uranus could not be observed, as the Planet was too low.—Hn.
22	56 Aurigæ	20	. .	59.265	68.974	9.1	97.40	. .	5 A	3	H.	
23	56 Aurigæ	20	. .	59.269	68.978	9.1	97.45	. .	5 A	3	H.	
	Σ 1169	10	. .	62.011	66.198	9.6	107.42	. .	3 A	3	H.	
	Σ 1321	60	. .	62.132	66.077	9.9	59.35	. .	3 A	3	H.	
	7 Leonis	80	. .	59.940	68.258	10.3	218.55	. .	3 A	3	H.	
	Lalande 18231 . .	70	. .	63.927	64.315	10.6	235.0	. .	3 A	2	H.	
	γ Leonis	110	. .	63.753	64.464	10.9	186.9	. .	3 A	1	H.	Images the worst I have ever observed of any star. Parallel, 208°.40.
	Gr. Cat. 4403, 1 and 2	. .	. .	50.694	64.113	. .	60.3	. .	2 A	1	Hn.	Very poor. The line joining 9 and 35 is perpendicular to the line 1–2.
				59.995	64.113	. .	. .	. .	2 A	1	Hn.	Setting, 150°.2. The measures of the distance at which the nebulosity follows star 1 on the line 1–2. All rather uncertain. The dark space bounded by stars 1, 2, 7, 28, 73, 11, &c., is a pretty regular oval, of which the south part is the darkest.

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
r. 24	Σ 1169	10	. .	62.002	66.225	10.0	107.00	. .	3 A	2	H.	Faint, clouds.
	7 Leonis	80	. .	59.933	68.291	10.6	218.54	. .	3 A	2	H.	Through clouds.
25	7 Leonis	80	. .	59.955	68.256	9.5	218.66	. .	3 A	2	H.	
	Σ 1350	75	. .	63.040	65.183	10.6	51.7	. .	3 A	2	H.	
	Σ 1495	30	. .	60 625	67.574	10.9	80.4	. .	3 A	2	H.	Images much blurred. The night is a poor one for double stars, the images being blurred and rather unsteady.
ay 1	Lalande 22020 (Br.) .	60	. .	64.042	64.182	11.8	50.5	. .	5 A	2	H.	Very difficult; poor images, 10th mag.
2	Σ 1350	70	. .	63.041	65.160	10.3	52.12	. .	3 A	2	H.	
	Σ 1263	25	. .	60.172	68.017	10.9	99.24	. .	3 A	2	H.	
	Σ 1495	40	. .	60.600	67.570	11.4	80.10	. .	3 A	2	H.	Parallel, 28°.40.
	Σ 1685	190	. .	62.502	65.724	12.2	96.85	. .	3 A	2	H.	T = 45°.
	Zodiacal Light . .	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	At 9^h 30^m, the zodiacal light was quite strong though diffuse, and in it I noticed a very much brighter streak (*a*), perhaps 1° broad, as in sketch. Professor HALL and myself, at 9^h 45^m, also saw a second (*b*), somewhat fainter and not so broad. At 10^h, it had been hidden by horizon clouds.
12	Lalande 22020 . .	70	. . .	64.056	64.175	11.1	49.9	. .	5 A	2	H.	Both 10th mags.
	O. Arg. S. 11836 . .	90	. .	64.029	64.198	11.4	33.5	. .	5 A	2	H.	Parallel, 28°.4.
14	A. C. 5	. .	. .	. .	. .	. .	112.0	. .	6 A	.	H.	By estimation. Images too bad for measures.
	O. Arg. S. 11836 . .	90	. .	64.022	64.211	11.4	34.8	. .	5 A	2	H.	
	Σ 1685	200	. .	62.508	65.731	11.9	97.4	. .	3 A	2	H.	
	Σ 1350	70	. .	63.033	65.171	12.5	52.9	. .	3 A	2	H.	
	Σ 1495	70	. .	60.606	67.582	12.8	80.78	. .	3 A	2	H.	
	Σ 1603	85	. .	61.847	66.367	13.3	36.78	. .	3 A	2	H.	
16	Σ 1350	. .	. .	63.037	65.181	13.9	233.0	. .	3 A	2	H.	Images diffuse.
	Σ 1495	. .	. .	60.598	67.612	14.3	81.82	. .	3 A	2	H.	
	Σ 1603	. .	. .	61.854	66.376	14.6	218.52	. .	3 A	2	H.	
	ι Bootis	60	. .	60.271	67.972	15.0	86.58	. .	3 A	3	H.	
	Σ 1685	200	. .	62.484	65.714	15.5	98.5	. .	3 A	2	H.	Parallel, 209°.30. Thin clouds for the north stars and diffuse images for all.
17	Σ 1350	60	. .	63.019	65.162	14.2	232.9	. .	3 A	3	H.	Thin clouds; images steady.
	Σ 1495	40	. .	60.576	67.569	14.5	81.68	. .	3 A	3	H.	
	Σ 1603	85	. .	61.793	66.303	14.9	217.85	. .	3 A	3	H.	
	ι Bootis	30	. .	60.185	67.921	15.3	266.42	. .	3 A	3	H.	Examined with power 5 A. No duplicity suspected of bright star.
	Σ 1685	200	. .	62.434	65.701	15.7	278.65	.	3 A	3	H.	
	ε Coronæ Borealis .	0	. .	63.820	64.291	16.0	304.2	. .	5 A	2	H.	Very difficult to observe.
18	Σ 1495	40	. .	60.564	67.557	13.6	81.6	. .	3 A	2	H.	
	Σ 1603	70	. .	61.817	66.305	13.9	217.48	. .	3 A	2	H.	
	ι Bootis	30	. . .	60.199	67.902	14.4	86.50	. .	3 A	2	H.	

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m.	r.	r.	h. m.	°	°				
May 18	Σ 1685	200	. .	62.438	65.689	14.8	278.0	. .	3 A	2	H.	
	γ Coronæ Borealis .	. .	. .	. .	. .	. .	. .	. .	.	.	H.	Images are too poor for this star. The images have been blazing to-night. Parallel, 209°.30.
19	Σ 1603	75	. .	61.800	66.342	13.2	37.88	. .	3 A	2	H.	Through clouds.
	ι Bootis	30	. .	60.213	67.932	13.6	266.52	. .	3 A	3	H.	
	Σ 1685	200	. .	62.419	65.687	14.1	99.12	. .	3 A	3	H.	
23	Σ 1603	80	. .	61.789	66.279	14.6	217.92	. .	3 A	2	H.	T = 59°.0. Telescope so much shaken by the wind that the measures are uncertain.
24	ι Bootis	30	. .	60.207	67.921	14.6	86.22	. .	3 A	2	H.	
	ζ Ursæ Majoris . .	150	. .	62.558	65.493	15.1	150.4	. .	3 A	2	H.	This star photographed at Cambridge. Images unsteady and blazing. Can do nothing with close stars.
25	. . . .	. .	. .	. .	. .	. .	. .	. .	.	.	.	Movable wire is not parallel to fixed wire, and micrometer taken out.
28	ι Bootis	30	. .	60.350	68.080	11.9	267.22	. .	3 A	2	H.	
	ζ Ursæ Majoris . .	150	. .	62.751	65.700	12.3	152.8	. .	3 A	2	H.	Images blazing.
	γ Leonis	100	. .	63.882	64.636	12.5	188.6	. .	3 A	2	H.	
	ε Coronæ Borealis .	. .	. .	. .	. .	. .	. .	. .	.	.	.	Images too poor for this star. Parallel, 30°.4.
	ζ Ursæ Majoris . .	300	. .	. .	. .	13.4	185.9	. .	3 A	1	H.	Images too bad for measurement of distances.
	57 Ursæ Majoris . .	180	. .	63.650	64.777	13.6	116.9	. .	3 A	2	H.	
	ε Coronæ Borealis .	. .	. .	. .	. .	. .	. .	. .	.	.	.	At 14ʰ.2, images still too poor to see the companion. Images have been blazing to-night, and bad for measurement.
	G. C. 4403–4405 and *h* 1901.	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	All too faint to observe, and seeing bad for the stars—JUPITER seeing very bad.
29	ξ Ursæ Majoris . .	300	. .	63.962	64.384	14.5	186.0	. .	3 A	2	H.	Blazing images.
	57 Ursæ Majoris . .	5	. .	63.670	64.746	14.8	119.1	. .	3 A	2	H.	
	ζ Ursæ Majoris . .	150	. .	62.740	65.704	15.1	152.0	. .	3 A	2	H.	
	μ Draconis . . .	160	. .	63.933	64.472	15.3	310.8	. .	3 A	2	H.	
31	ζ Ursæ Majoris . .	150	. .	62.778	65.727	15.1	152.3	. .	3 A	2	H.	
	μ Draconis . . .	170	. .	63.970	64.516	15.4	129.5	. .	3 A	2	H.	
	ν Draconis . . .	140	. .	57.983	70.462	15.8	168.05	. .	3 A	2	H.	Parallel, 210°.40.
June 2	ζ Ursæ Majoris . .	150	. .	62.749	65.661	14.3	151.4	. .	3 A	3	H.	
	μ Draconis . . .	170	. .	63.944	64.475	14.7	130.8	. .	3 A	3	H.	
	ν Draconis . . .	300	. .	57.995	70.455	15.0	167.62	. .	3 A	4	H.	
	Σ 2034	100	. .	64.099	64.358	15.4	188.4	. .	5 A	2	H.	Very faint; hazy.
	Σ 2326	170	. .	62.607	65.812	15.8	281.3	. .	5 A	3	H.	
	ε_1 Lyræ	20	. .	63.912	64.512	16.1	103.6	. .	3 A	2	H.	
	ε_2 Lyræ	150	. .	63.974	64.476	16.4	160.2	. .	3 A	2	H.	
	φ Draconis . . .	. .	. .	. .	. .	. .	. .	. .	5 A	.	H.	Images so bad that this star is not separated.
	Σ 2404	180	. .	63.855	64.589	16.6	118.2	. .	3 A	3	H.	Parallel, 29°.90.
4	ζ Ursæ Majoris . .	150	. .	62.763	65.672	15.3	151.1	. .	3 A	3	H.	
	μ Draconis . . .	170	. .	63.940	64.480	15.6	130.5	. .	3 A	2	H.	
	ν Draconis . . .	300	. .	57.992	70.431	16.0	167.50	. .	3 A	2	H.	

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
ne 4	Σ 2326	190	. .	62.606	65.828	16.4	280.6	. .	3 A	2	H.	
	ϵ_1 Lyræ	20	. .	63.902	64.554	16.7	103.2	. .	3 A	2	H.	
	ϵ_2 Lyræ	140	. .	63.971	64.457	16.8	163.0	. .	3 A	2	H.	
	Σ 2404	180	. .	63.860	64.586	17.1	117.7	. .	3 A	2	H.	Parallel, 29°.87.
11	μ Draconis . . .	170	. .	63.946	64.451	15.3	130.0	. .	3 A	3	H.	
	ν Draconis . . .	310	. .	57.969	70.430	15.7	166.75	. .	3 A	3	H.	Parallel, 209°.20.
	ϵ_1 Lyræ	20	. .	63.905	64.508	16.2	103.0	. .	3 A	2	H.	
	ϵ_2 Lyræ	140	. .	63.960	64.460	16.4	162.8	. .	3 A	2	H.	Thin clouds.
13	Σ 2034	100	. .	64.103	64.312	14.4	184.2	. .	5 A	3	H.	
	Σ 2326	190	. .	62.625	65.823	14.8	100.8	. .	5 A	3	H.	
	Σ 2452	170	. .	63.639	64.813	15.4	261.0	. .	3 A	2	H.	Haze, and stars faint.
	ϵ_1 Lyræ	20	. .	63.910	64.529	15.7	104.1	. .	3 A	2	H.	
	ϵ_2 Lyræ	140	. .	63.995	64.478	15.9	162.0	. .	3 A	2	H.	Thin clouds and haze all the night and stars faint at times.
14	G. C. 4355	270	. .	. .	. .	. .	198.4	. .	400	1	Hn.	
16	Σ 2034	100	. .	64.110	64.350	14.4	184.4	. .	3 A	2	H.	
	Σ 2326	180	. .	62.632	65.817	14.8	280.7	. .	3 A	3	H.	
	Σ 2452	150	. .	63.658	64.801	15.2	260.1	. .	3 A	2	H.	
	Σ 2571	330	. .	63.081	65.366	15.6	278.2	. .	3 A	3	H.	
	ε Draconis . . .	340	. .	63.918	64.522	16.0	116.6	. .	3 A	2	H.	Images blazing.
	κ Cephei	80	. .	63.492	64.980	16.4	173.2	. .	3 A	2	H.	
18	SATURN's ring . . .	93	15 8	. .	. .	. .	204.38	. .	3 A	2	H.	The ring appears to diminish in brightness near the ball on both sides. I can see no difference in the brightness of the preceding and following parts of the ring.
	HYPERION	275	15 23	41.824	64.217	15 16	205.30	. .	3 A	2	H.	Twilight. Chron. corr. + $2^{m}.8$.
	Anonyma	95	15 40	62.305	66.090	15 33	21.15	. .	3 A	2	H.	Daylight. This object just south of the following edge of ring.
19	HYPERION	275	15 16	64.204	86.853	15 7	204.82	. .	3 A	2	H.	Clouds. Chron. corr. + $3^{m}.8$.
	SATURN's ring . . .	93	. .	. .	. .	15 21	204.40	. .	3 A	2	H.	Six satellites on preceding side of SATURN this morning. HYPERION, TITAN, and four inner ones, or one may be JAPETUS.
22	SATURN's ring . . .	95	. .	. .	. .	14 50	204.02	. .	3 A	2	H.	T = 50°.0.
	HYPERION	275	15 2	64.200	78.424	14 55.5	203.65	. .	3 A	2	H.	Chron. corr. + $4^{m}.0$.
	JAPETUS	320	15 16	55.067	73.264	15 9	173.22	. .	3 A	2	H.	Immediately after this observation noticed that the fixed wire of micrometer was much bent.
23	G. C. 4403, 2 and 7 .	. .	. .	. .	. .	17 2	137.5	. .	400	1	Hn.	Moonlight.
	2 and 73 .	. .	. .	. .	. .	. .	153.8	. .	400	1	Hn.	73 is quite bright; as bright as 2.
	1 and 35 .	. .	. .	. .	. .	. .	1.6	. .	400	1	Hn.	Parallel, 28°.96.
	1 and 6 .	. .	. .	. .	. .	. .	116.7	. .	400	1	Hn.	
	1 and 9 .	. .	. .	. .	. .	. .	166.9	. .	400	1	Hn.	
	2 and 8 .	. .	. .	. .	. .	. .	121.1	. .	400	1	Hn.	
	1 and 3 .	. .	. .	. .	. .	. .	131.65	. .	400	1	Hn.	Good measure, but this distance is too great for so small a field.

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	REMARKS.
1877.		°	h. m.	r.	r.	h. m.	°	°				
June 23	G. C. 4403, 1 and 2 .	. .	. .	. .	. .	. .	61.3	. .	400	1	Hn.	Seeing too poor for the fainter stars, or to measure distances.
	SATURN's ring. . .	95	. .	. .	. .	14 57	204.20	. .	3 A	2	H.	
	HYPERION	275	15 8.5	64.215	73.260	15 3	203.45	. .	3 A	2	H.	Some haze, and HYPERION excessively faint. Chron. corr. + 4^{m}.1.
	JAPETUS	300	. .	. .	. .	15 13.6	186.05	. .	3 A	2	H.	The fixed wire is still crooked and not fit to measure distances.
25	SATURN's ring. . .	95	. .	. .	. .	14 46	204.70	. .	3 A	2	H.	
	JAPETUS	280	15 1.5	44.891	64.295	14 54	198.61	. .	3 A	2	H.	Images became very poor. Parallel, 209°.45.
July 6	G. C. 4355, 1 and 10 .	. .	. .	68.09	. .	9 30	0.0	. .	2 A	2	Hn.	
	1 and 11 .	. .	. .	60.33	. .	9 42	54.2	. .	2 A	2	Hn.	
	1 and 6 .	. .	. .	57.50	. .	9 54	62.9	. .	2 A	2	Hn.	
	1 and 5 .	. .	. .	52.84	. .	10 6	63.6	. .	2 A	2	Hn.	
	1 and 13 .	. .	. .	52.235	. .	10 18	95.9	. .	2 A	2	Hn.	
	1 and 12 .	. .	. .	56.69	. .	10 30	100.3	. .	2 A	2	Hn.	This is very nearly the position of 1 and 19. If anything the position of 1 and 19 is greater than the position of 1 and 12.
	1 and 4 .	. .	. .	42.92	. .	10 42	145.1	. .	2 A	2	Hn.	
	1 and 20 .	. .	. .	. .	. .	10 54	86.5	. .	2 A	2	Hn.	This is nearly the position of 1 and 2.
	1 and 18 .	. .	11 6	55.39	64.268	(*)	. .	. .	2 A	2	Hn.	* Coincidence of wires. 48 a little less Δδ than 18; 41 and 44 a little greater. All the distances measured on this day are differences of declination. Ended at 11^{h} 30^{m} on account of poor seeing.
7	Σ 2034	100	. .	64.111	64.401	15.2	186.8	. .	3 A	2	H.	Blurred images.
	Σ 2452	250	. .	63.684	64.834	15.6	260.8	. .	3 A	2	H.	
	Σ 2571	330	. .	63.100	65.394	16.0	278.6	. .	3 A	2	H.	
	ε Draconis	300	. .	63.986	64.536	16.3	297.9	. .	3 A	2	H.	
	κ Cephei	80	. .	63.515	65.019	16.7	176.1	. .	3 A	2	H.	Parallel, 209°.53.
10	SATURN's satellite .	. .	14 0	. .	. .	. .	. .	. .	400	1	Hn.	Lacks about a diameter of satellite's disk of being up.
			14 12.5	. .	. .	. .	. .	. .	.	.	.	Not up yet.
			16.5	. .	. .	. .	. .	. .	.	.	.	Nearly up.
			17.7	. .	. .	. .	. .	. .	.	.	.	Up now.
			20.0	. .	. .	. .	. .	. .	.	.	.	Past.
			24.8	. .	. .	. .	. .	. .	.	.	.	Certainly past.
			26.5	. .	. .	. .	. .	. .	.	.	.	Past by more than radius of satellite's disk. Seeing very poor; clouds. Chron. corr. — 1^{m}.0.
	SATURN's ring . .	. .	. .	. .	. .	14.8	24.33	. .	400	1	Hn.	
11	JUPITER	. .	. .	. .	. .	. .	. .	. .	.	.	Hn	13^{s} preceding JUPITER, and 3″ north of JUPITER's north limb is a star 11–12 mag. This will be occulted during daylight.
11	G. C. 4403, 1 and 2 .	. .	.	50.852	64.278	12.0	241.7	. .	2 A	2	Hn.	Clear sky; images unsteady.
	G. C. 4403, 1 and 2 .	. .	. .	58.79	64.28	. .	. .	. .	2 A	2	Hn.	Placing the fixed wire on 1 and perpendicular to the line 1–2, the wire A was placed at the limit of the nebulosity of the preceding part of the hook on the line 1–2; that is, between the wires 1–2 it was nebulous between wire A and 2 black; beyond fixed wire black.

E.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
11	Lines 1–35 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	Situation with regard to the nebulosity. All immersed.
	1–36 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	36–39 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	36–34 . . .	.	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	East $\frac{7}{10}$ all immersed; west $\frac{3}{10}$ free; that is, 34 in the dark.
	36–10 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	36–45 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	36–46 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	36–11 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed. Possibly 11 is just outside of the edge of the nebula, but I think the above is correct.
	14–13 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	14–44 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed; 15 very faint.
	14–3 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed; 43 greater than 14.
	14–43 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed; 43 less than 11.
	14–42 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed; 43 greater than 44.
	7–2 . . .	. .	. .	. .	. .	. .	. .	. .	.	2	Hn.	If this is the preceding edge of the nebula it is the very edge. This edge often appears to be a little following 7–2, and to leave 7 in the black.
	7–28 . . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	All immersed.
	8 and 28 . .	. .	. .	. .	. .	. .	. .	. .	2 A	2	Hn.	Are on the preceding side of a dark lane extending toward the south as far as 2; it appears to connect with A, and 7 appears also to be near its preceding edge; 2 is on its following edge. I think it connects by a branch to the black space near 40 and 41.
	SATURN.	. .	. .	. .	. .	. .	. .	. .	2 A	.	Hn.	The dark shadow on the ball is about as thick as one of the wires of the micrometer, that is, about 0".25. It is by no means black, and the edges seem to be softened off considerably and equally on both the north and south sides. This is probably due to the light of the ball. It appears as if this dark line continued in both directions (east and west) along the south edges of both ansæ. This appearance is probably caused by the fact that the axis of the ansæ bisects the disk, while the dark shadow is south of the center by over 1' (est). The line of the dark shadow prolonged is accurately the limit toward the south of each ansa. The ansæ seem exactly alike as far as I can see to-night. The south edge is convex towards the south at the end; it is quite thin, but extends up to the ball. The north edge is certainly by no means so well defined as the other, and it appears nebulous at the edge. The ball is elliptical. No square-shouldered aspect is apparent to-night. Seeing poor; unsteady images.
	SATURN's ring . .	. .	. .	. .	. .	. .	24.85	. .	6 A	1	Hn.	Very unsteady.
	SATURN's ring . .	. .	. .	64.278	(*)	. .	24.95	. .	400	.	Hn.	*Coincidence of wires.
2	Σ 2034	110	. .	64.156	64.416	15.4	185.7	. .	3 A	2	H.	
	Σ 2571	15	. .	63.129	65.433	15.8	278.6	. .	3 A	2	H.	
	ε Draconis . . .	0	. .	63.984	64.581	16.1	122.3	. .	3 A	2	H.	Images blurred.
	κ Cephei	120	. .	63.530	65.025	16.4	177.0	. .	3 A	2	H.	
	Σ 2404	180	. .	63.934	64.622	16.9	118.8	. .	3 A	2	H.	

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	REMARKS.
1877.		°	h. m.	r.	r.	h. m.	°	°				
July 12	Anonyma	190	. .	64.189	64.378	17.2	89.5	. .	3 A	2	H.	
	G. C. 4355, 12 and 13 .	. .	. .	. .	. .	. .	269.0	. .	400	.	Hn.	The line of 12–13 passes west of 1, and the nebulosity near 1 is still west of that. Star No. 3 is east of the line 12–13 by about 1″.
	1 and 12 .	. .	. .	. .	. .	. .	280.5	. .	400	.	Hn	Parallel, 29°.53.
	1 and 18 .	. .	. .	. .	71.224	. .	. .	. .	400	.	Hn.	This line bisects A, roughly speaking.
	1 and 12 .	. .	. .	61.656	. .	. .	. .	. .	.	.	Hn.	
	1 and 13 .	. .	. .	59.085	. .	. .	. .	. .	.	.	Hn.	
	1 and 11 .	. .	. .	55.848	. .	. .	. .	. .	400	2	Hn.	
	1 and 6 .	. .	. .	54.095	. .	. .	. .	. .	400	2	Hn.	
	1 and 5 .	. .	. .	47.527	. .	. .	. .	. .	400	2	Hn.	7 is a little west of the meridian of 5.
	1 and 20 .	. .	. .	66.57	. .	. .	. .	. .	400	2	Hn.	These measures are all differences of right ascension.
	1 and 14 .	. .	. .	63.080	. .	. .	. .	. .	400	2	Hn.	On the line 14–20 there is a nebulosity from 14 to edge of γ, then black to edge of A, then nebulosity to edge of A again, and then black in β; that is, the position end of A is cut off by this line. The nebulosity just following the line 14–20 is fainter for 3″–6″, but beyond this line it is uniformly bright up to 1–2–19.
13	ε Draconis . . .	0	. .	63.978	64.559	15.5	115.5	. .	3 A	2	H.	
	Σ 2571	20	. .	63.124	65.402	15.8	278.8	. .	3 A	2	H.	
	κ Cephei	120	. .	63.532	65.019	16.1	174.5	. .	3 A	2	H.	
	Σ 2404	180	. .	63.900	64.634	16.7	117.8	. .	3 A	2	H.	
	Anonyma	200	. .	64.204	63.358	17.0	91.4	. .	5 A	2	H.	The stars are 10th mags.
	70 Ophiuchi . . .	80	. .	63.920	64.624	17.2	43.5	. .	3 A	2	H.	
	τ Ophiuchi . . .	260	. .	64.117	64.421	17.8	49.1	. .	3 A	2	H.	Images blurred,
	G. C. 4355	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	The line 14–20 passes through the nebula near 1–2, but through a fainter part; it is about tangent to nebulosity of the same brightness as that near 1–2 on the following side.
	14–20 . . .	. .	. .	. .	. .	. .	289.8	. .	2 A	.	Hn.	
	1 and 18 . . .	. .	. .	. .	. .	. .	337.6	. .	400	.	Hn.	
	1 and 10 . . .	. .	. .	64.270	68.022	. .	359.9	. .	400	.	Hn.	
	1 and 14 . . .	. .	. .	. .	. .	. .	295.4	. .	400	.	Hn.	
	1 and 12 . . .	. .	. .	56.613	64.270	. .	280.0	. .	400	.	Hn.	
	1 and 13 . . .	. .	. .	. .	. .	. .	276.2	. .	400	.	Hn.	
	1 and 6 . . .	. .	. .	57.547	64.270	. .	242.7	. .	400	.	Hn,	
	1 and 11 . . .	. .	. .	60.397	64.270	. .	234.0	. .	400	.	Hn.	
	1 and 5 . . .	. .	. .	. .	. .	. .	243.4	. .	.	.	Hn.	
	1 and 20 . . .	. .	. .	64.270	67.734	12 40	. .	. .	.	2	Hn.	Nebula low and stars unsteady. Di ferences of declination.
	SATURN's ring . .	. .	. .	. .	. .	14	24.50	. .	400	2	Hn.	
14	ε Coronæ Borealis .	. .	. .	. .	. .	. .	. .	. .	3 A 5 A 6 A	.	H.	Images so blazing that the compani cannot be seen.

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
ly 14	Σ 2796	35	. .	61.735	66.805	16.1	256.55	. .	3 A	2	H.	Very unsteady. Parallel, 209°.50.
	Anonyma	220	. .	63.380	64.164	17.3.	68.5	. .	3 A	2	H.	9th and 10th mags. This is the star observed Sept. 4, 1876.
16	ε Coronæ Borealis .	. .	. .	. .	. .	. .	. .	. .	3 A & 5 A	.	H.	The companion just visible at times.
	Antares	270	. .	63.949	64.584	16.4	30.0	. .	3 A	2	H.	
	τ Ophiuchi . . .	260	. .	64.102	64.414	17.2	49.7	. .	3 A	3	H.	
	70 Ophiuchi . . .	85	. .	63.938	64.602	17.5	43.4	. .	3 A	3	H.	
	Anonyma	230	. .	64.147	64.367	17.7	69.8	. .	3 A	3	H.	
	G. C. 4355 = s. h. 379, B and D.	270	. .	64.044	64.510	. .	19.1	. .	400	3	Hn.	I suspect D to be variable.
	1 and 5 . . .	. .	. .	47.458	64.270	. .	. .	. .	400	2	Hn.	
	1 and 6 . . .	. .	. .	54.076	64.270	. .	. .	. .	400	.	Hn.	
	1 and 11. . .	. .	. .	55.861	64.270	. .	. .	. .	400	2	Hn.	11 very faint and 1 very unsteady.
	1 and 13. . .	. .	. .	59.077	64.270	. .	. .	. .	400	1	Hn.	Seeing very bad and clouds. All these measures are differences of right ascension.
24	ANTARES	270	. .	63.924	64.610	16.3	26.3	. .	3 A	2	H.	
	τ Ophiuchi . . .	250	. .	64.097	64.420	16.6	50.1	. .	3 A	2	H.	
	70 Ophiuchi . . .	75	. .	63.926	64.586	16.9	43.6	. .	3 A	2	H.	
	Σ 2402	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	Poor images; clouds. Parallel, 209°.5. I find the faint pair observed July 12, but no pair of 8th mag.
25	ANTARES	270	. .	63.948	64.583	16.0	26.9	. .	3 A	2	H.	Images blazing very much.
	JUPITER	. .	. .	. .	. .	. .	. .	. .	400	.	Hn.	White spot in the north belt. It is a little west of the center at $9^h 33^m 30^s$, mean time.
	G. C. 4355, 1 and 5 .	. .	. .	47.382	52.849	9 44	. .	. .	400	2	Hn.	
	1 and 10 .	. .	. .	57.668	. .	9 56						
	1 and 13 .	. .	. .	59.082	52.286	10 8	. .	. .	400	2	Hn.	
	1 and 12 .	. .	. .	61.647	. .	10 20	. .	. .	400	.	Hn.	These measures are all differences of right ascension and declination. Coincidence of wires = $64^r.261$.
	1 and 14 .	. .	. .	62.968	46.751	10 35						
	1 and 20 .	. .	. .	. .	67.62	10 53	. .	. .	400	.	Hn.	Seeing very poor, and so much moonlight that no nebulosity was visible. In the triple star s. h. 379 D is far brighter than any of the small components, of which D and E only are visible to-night. E is quite faint, fainter than 20.
26	ANTARES	270	. .	63.944	64.612	16.3	29.5	. .	3 A	2	H.	
	τ Ophiuchi . . .	250	. .	64.114	64.408	17.3	54.2	. .	3 A	3	H.	
	70 Ophiuchi . . .	75	. .	63.924	64.599	17.6	45.0	. .	3 A	3	H.	Parallel, 30°.3.
	G. C. 4355, 12–13. .	. .	. .	. .	. .	. .	269.0	. .	400	3	Hn.	Moonlight. Placing the micrometer wire through 12-13 the wire runs west of 1-2-19, but is involved in fainter nebulosity Half way from this wire to star 1 the nebulosity becomes bright and so continues up to and beyond 1. With 400 and with 5 A the stars 1-2-19 appear to be about symmetrically surrounded by an oval mass of nebulosity separated from the west of A by a fainter band following 1-2-19. This must be verified under good conditions.

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II				
		°	h. m.	r.	r.	h. m.	°	°				
1877. July 26	G. C. 4355, 14-20 . .	. .	. .	. .	. .	. .	290.4	. .	400	3	Hn.	This line is involved in A near 2, but only in fainter nebulosity.
	1-10 . .	. .	. .	. .	. .	. .	. .	. .	400	3	Hn.	Involved west of 1 by some seconds. At 10^{h} moonlight too strong for the nebula.
30	G. C. 4447. A and D, Ring Nebula of Lyræ.	310	. .	53.992	74.384	17.8	166.6	. .	3 A	2	H.	D is a double star 13th mag. Another companion of 14-15 mag. about 10" distant. Line from A to D is very nearly tangent to the nebula.
	A and B. . .	230	. .	54.856	73.759	18.0	254.7	. .	3 A	2	H.	B is a 14th mag. star. Line A-B is 11" outside of nebula.
	A and C. . .	270	. .	52.649	75.940	18.2	212.1	. .	3 A	2	H.	C is of 13th mag. Line A-C very nearly bisects the dark part of nebula. A is a 10th mag. near following side of nebula. Position of star A for 1877.0 is $a = 18^{h} 49^{m} 2^{s}$; N.P.D. = 57° 7'.5. Parallel, =30° 30.
	G. C. 4355	. .	. .	. .	. .	. .	. .	. .	2 A	.	Hn.	The line 3-35 is almost exactly parallel to the line 12-13, and intersects the nebulosity near 1-2-19.
	Line joining 20 and 16	. .	. .	. .	. .	. .	317.6	. .	2 A	.	Hn.	New dark channel between 1 and 10, it extends no further east than 10, and 10 and 11 are on or near its following borders. Its preceding border about 20"-30" following 1-2-19. The seeing is poor, and this point should be re-examined. 21 is involved in C a few seconds, but is close to north edge; 35 well involved; 36, 37, and 38 are correct in map. The brightest portion is about 1-2-19. It is an oval mass nearly symmetrically disposed about the stars. It is more extended toward the east of 1 than toward the west. The next brightest nebulosity is near 36, but this is not much brighter than the brightest part of B near 18. Star 26 is within the brighter nebulosity, the boundary line of which runs between 5 and 26, but much nearer 26 than 5. Stars 5, 27, and 28 are on the preceding edge of the fainter part of A. The triangle 40, 44, 21 has no nebulosity which is at all bright within it except A^{1}. Clouds.
31	ζ Herculis	140	. .	64.154	64.393	16.6	166.9	. .	5 A	2	H.	Through clouds.
	36 Ophiuchi . . .	200	. .	63.824	64.732	17.1	96.4	. .	3 A	2	H.	
	μ^{1} Herculis . . .	230	. .	64.200	64.368	17.4	66.8	. .	5 A	3	H.	
	Ring Nebula, A and B	230	. .	54.828	73.701	. .	254.9	. .	3 A	3	H.	
	A and C	270	. .	52.551	75.838	. .	212.5	. .	3 A	3	H.	
	A and D	310	. .	53.982	74.520	. .	166.6	. .	3 A	3	H.	The line B-C is nearly tangent to nebula; B and C are 14th mag.; D is 13th-14th mag. D is a triple star. There are two bright stars in the nebula in the angle C A D, on the side opposite A.
	G. C. 4355, 21 and 1 .	. .	. .	64.244	70.851	. .	. .	. .	400	.	Hn.	These are differences of declination and about the mean of 38 and 37. Clouds.
Aug. 3	ζ Herculis	. .	. .	64.140	64.399	16.3	165.7	. .	3 A	2	H.	The images of this star are always blazing.
	36 Ophiuchi . . .	200	. .	63.827	64.719	16.6	98.2	. .	3 A	2	H.	

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
ug. 3	μ^1 Herculis . . .	230	. .	64.198	64.370	16.9	68.2	. .	5 A	3	H.	
	Ring nebula, A and *d*	280	. .	50.258	78.140	17.3	193.3	. .	3 A	3	H.	*d* is 12-13 mag.
	A and *e*	282	. .	51.870	76.628	17.5	187.7	. .	3 A	3	H.	*e* is 12th mag.
	A and *g*	355	. .	56.536	72.053	17.6	129.2	. .	3 A	3	H.	*g* is 13th mag.
	$D_{1,2}$.	260	. .	63.853	64.602	. .	225.2	. .	3 A	3	H	D_2 is 13-14 mag.
	$D_{1,3}$.	10	. .	62.384	65.967	. .	114.4	. .	3 A	3	H.	D_3 is 14th mag.
	$\epsilon_{1,2}$ Lyræ	. .	. .	. .	. .	. .	. .	. .	3 A	3	H.	The sketch made July 31 is correct. There seems to be a bright point at the place of that ⊡ sketch.
	G. C. 4355, 1 and 15 .	. .	19 15	64.244	85.491	. .	. .	. .	400	.	Hn.	Difference of declination. Order of brightness of the principal stars 1, 2, 3, 4, 5, 6, 7 . . . 10, 11, 12, 13, 14 . . 18, 20, 26, 21, 25 ; 39 is extremely faint. Clouds.
	SATURN's ring . . .	. .	. .	. .	. .	. .	25.00	. .	400	2	Hn.	
	MARS	. .	12 0	. .	. .	. .	. .	. .	. .	.	Hn.	Too unsteady to draw. The only points to be distinguished were, 1st, that the south-polar "ice-cap" was separated from the rest of the planet by a dark band north of it, and that it was by no means elliptical in shape, but a sharp point extending towards the middle of the following radius of the planet was very marked.
4	Ring nebula, *a* and *d*	290	. .	50.232	78.074	16.5	193.5	. .	3 A	2	H.	
	a and *e*	295	. .	51.981	76.646	16.7	187.7	. .	3 A	2	H.	
	f and f_1	250	. .	63.820	64.663	. .	48.8	. .	3 A	2	H.	
	f and f_2	10	. .	62.387	65.769	. .	116.6	. .	3 A	2	H.	f_2 is 14-15 mag.
	a and *g*	350	. .	56.497	72.014	. .	130.2	. .	3 A	2	H.	Parallel, 30°.3. On the nights July 30 and 31, August 3 and 4, I could see no stars inside the ring of stars *a, b, c, d, e, f, g;* and no stars in the nebula.
10	MARS' white spot; south pole.	170	. .	. .	. .	13 25	139.4	. .	3 A	2	H.	Planet blazing ; clouds passing.
	SATURN's ring . .	95	. .	. .	. .	13 38	25.55	. .	3 A	2	H.	Cloudy.
	TITAN	280	13 59	59.817	68.682	13 48	18.98	. .	3 A	2	H.	
	HYPERION	90	14 16	64.269	83.035	14 10	27.50	. .	3 A	3	H.	
	JAPETUS	90	14 31	56.569	71.933	14 22	26.15	. .	3 A	3	H.	Parallel, 30°.3. Looked for d'Arrest's comet, but sky was too thick. Chron. corr. + $2^m.6$.
11	SATURN's ring . .	95	. .	. .	. .	11 36	25.50	. .	3 A	3	H.	The seeing good for a few minutes.
	MIMAS	95	11 41	61.542	66.918	11 40	94.7	. .	3 A	3	H.	Axis of ring.
	TITAN	80	11 54	61.641	66.895	11 47	38.30	. .	3 A	3	H.	
	ENCELADUS . . .	95	12 7	61.612	66.919	12 0	24.6	. .	3 A	3	H.	
	Satellite?	280	12 19	61.164	67.410	12 12	22.1	. .	3 A	2	H.	
	Satellite?	95	12 31	59.685	68.808	12 24	26.5	. .	3 A	2	H.	
	RHEA ?.	97	12 44	59.037	69.516	12 38	22.9	. .	3	2	H.	
	HYPERION	95	12 59	64.272	86.248	12 53	26.80	. .	3 A	2	H.	Parallel, 30°.23. Chron. corr. + $2^m.6$. The seeing good at first. The object in $p = 280°.0$ is below plane of ring; RHEA is above plane of ring.

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. Aug. 11	Mars' white spot . .	170	. .	. .	. .	14 5	139.5	. .	3 A	4	H.	Seeing good for Mars. The edge of the white spot has two notches near the center of its outline.
	A faint star near Mars = Deimos.	70	14 42	64.272	71.350 .380	14 37 38	59.8 61.4	. .	3 A	3	H.	Chron. corr. + 2m.6. This proves to be Satellite I. See August 16, *et seq.*
	Mean	. .	14 44.6	64.272	71.365	14 40.1	60.60					
	Saturn's ring . . .	95	. .	. .	. .	12 35	25 22	. .	3 A	2	H.	
15	Mars' white spot . .	. .	. .	. .	. .	14 2	141.2	. .	3 A	2	H.	Images blazing. Chron. corr. + 2m.0.
16	Star near Mars = Deimos.	. .	11 42	64.267	72.071	. .	. .	. .	.	.	H.	Single distance; rough.
	Mars' white spot . .	160	. .	. .	. .	11 48	138.8	. .	3 A	2	H.	Images blurred.
	Saturn's ring . . .	95	. .	. .	. .	12 54	25.25	. .	3 A	3	H.	
	Mars' star = Deimos	75	13 8 12	64.266 .268 .268 .266	72.505 .360 .344 .359	13 5 6	48.1 48.5	. .	3 A	3	H.	Single distance. At 13h 36m set for distance of Mars' star again, and micrometer read 72r.350. Chron. corr. +2m.0.
	Mean	. .	13 12.0	64.267	72.392	13 7.5	48.30					
17	Mars' white spot . .	160	. .	. .	. .	11 35	138.4	. .	3 A	3	H.	
	Mimas	275	13 3	60.345	67.163	. .	. .	. .	3 A	2	H.	In axis of ring at 13h. $p = 94^\circ.9$.
	Saturn's ring. . .	95	. .	. .	. .	13 8	25.3	. .	3 A	3	H.	At intervals when the seeing is good, I think I can see the dark openings of the ring on each side of the ball, between the ball and the ring.
	Mars' star = Deimos	90	16 16 17 29	. .	70.579 .642 .645	15 59 16 0	35.2 34.2	. .	3 A	3	H.	
	Mean	. .	16 22.8	64.265	70.622	16 1.7	34.70					
	Mars' star = Phobos	70	16 12 13 23 27		67.376 .346 .372 .354	16 3 5	47.3 47.0	. .	3 A	3	H.	Daylight. Both the above objects faint, but distinctly seen both by G. Anderson and myself. Chron. corr. + 2m.1.
	Mean	. .	16 20.9	64.265	67.362	16 6.1	47.15					
18	Mars' star = Deimos	250	9 40	. .	. .	. .	. .	. .	3 A	.	H.	Images very poor, but saw the satellite immediately.
	Deimos	. .	. .	. .	. .	. .	. .	. .	.	.	.	Seeing extremely bad, still I saw the companion without any difficulty. Halo around the planet very bright, and the satellite was visible in this halo.—Todd.
	Deimos	250	10 5 15	56.070 55.940 55.987	72.540 .495 .496	10 24 30	50.0 47.9 47.5	. .	3 A	.	.	Chron. corr. 0m.0.—Newcomb.
	Mean	. .	10 10	55.999	72.510	10 27.0	48.47					
			10 36	55.921	72.482	. .	. .	. .	3 A	.	.	Position for dist., 129°.3.—Newcomb.
	Mars' sat. = Deimos .	. .	11 4	54.625 57.495	. .	10 56	235.70	. .	3 A	.	.	Measures from the limb of the planet. 15th mag. (est.).—Harkness.
	Mean	. .	11 4	56.060	64.265							
	Mars' star (close) Phobos.	. .	11 32 39	60.665 .770	67.656 .712	11 29 30	50.4 52.4	. .	3 A	3	H.	This object (first seen by Todd at 11h 7m) is very difficult to observe.
	Mean	. .	11 35.5	60.718	67.684	11 29.5	51.40					

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. ug. 18	MARS' sat. = Deimos .	250	11 52 59	56.064 55.991	72.510 .424	11 46 50	53.7 53.8 53.3 53.8	. .	3 A	3	H.	I record an easy object $p=45^\circ \pm s=\frac{1}{4}$ diam. (3 A) field. I first saw it about 10^h.—TODD.
	Mean	. .	11 55.5	56.028	72.467	11 48.0	53.65					
	SATURN's ring . . .	. .	. .	. .	. .	12 12	25.25	. .	3 A	3	H.	
	SATURN's satellite . .	275	12 16	58.570	69.981	12 13	25.2	. .	3 A	3	H.	
	SATURN's satellite . .	280	12 24	61.087	67.421	12 20	200.5	. .	3 A	3	H.	
	SATURN's satellite . .	273	12 34	61.428	67.094	12 28	208.4	. .	3 A	3	H.	
	TITAN	100	12 45	57.739	70.782	12 38	200.78	. .	3 A	3	H.	
	HYPERION	272	14 53.5	64.265	75.993	12 49	28.85	. .	3 A	3	H.	Chron. corr. $0^m.0$.
	MARS' sat. = Deimos .	235	14 35 41	58.258 .111	70.488 .425	14 28 33	68.3 69.0 67.4 67.6	. .	3 A	3	H.	Chron. corr. + $2^m.1$.
	Mean	. .	14 40.1	58.184	70.456	14 32.6	68.08					
	MARS' spot	160	. .	. .	. .	14 46	139.2	. .	3 A	3	H.	At $14^h\ 30^m$ I saw a faint object following MARS about 25″, which may be the same as the close object observed by Professor HALL at $11^h\ 29^m$. Its position angle 70° (est.).—TODD.
19	MARS' star (close), Phobos.	240	11 27 30	61.755	66.596	11 22 11 24	71.8 75.0	. .	3 A	3	H.	
	Mean	. .	11 30.7			11 25.2	73.40					
	MARS' sat. = Deimos .	290	11 46 51	59.741 .567	68.835 .946	11 40 43	17.8 16.3	. .	3 A	3	H.	
	Mean	. .	11 50.7	59.654	68.890	11 43.7	17.05					
	TITAN	250	12 52	62.960	65.600	12 47	56.5	. .	3 A	3	H.	Chron. corr. + $2^m.2$.
	HYPERION	275	13 1	46.547	64.265	12 56	27.80	. .	3 A	2	H.	Parallel, 30°.23.
			13 30	. .	. .	. .	. .	. .	.	.	.	I think I see something close following.
			13 43	. .	. .	. .	. .	. .	.	.	.	I now see clearly the object measured at $11^h\ 22^m$. It has emerged from behind the disk, and would seem to be, quite certainly, a second satellite.
			14 25	. .	. .	. .	. .	. .	.	.	.	Seeing fair. Greatest elongation of this supposed satellite out about 25″ $p=80^\circ \pm$.
			15 10	. .	. .	. .	. .	. .	.	.	.	Seeing much worse. Satellite seems to be going in.—TODD.
	MARS' sat. = Deimos .	250	15 46 54	*56.089 55.994 56.020	72.363 .378 .426	15 40 43	45.6 43.8 44.2 45.4	. .	3 A	2	H.	
	Mean	. .	15 52.2	56.034	72.389	15 43.7	44.75					
	MARS' sat. 1 = Deimos	50	12 2 9	58.075 .300	70.260 .206	11 53 57	68.3 68.7 67.4 68.1	. .	3 A	2	H.	
	Mean	. .	12 7.7	58.188	70.233	11 57.2	68.12					
	MARS' sat. 2 = Phobos	70	13 17 18 37	61.051 .012 .098	. .	13 13	53.10	. .	3 A	3	H.	
	Mean	. .	13 26.2	61.054	64.265							

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	REMARKS.
1877.		°	h. m.	r.	r.	h. m.	°	°				
Aug. 20	Mars' sat. 2 = Phobos	70	13 45	61.273	. .	. .	. .	. .	3 A	3	H.	
			51	.447								
			56	.590								
			14 5	.889								
	Mean		13 56.4	61.550	64.265							
	Mars' sat. 2 = Phobos	70	14 13	62.091	. .	. .	. .	. .	3 A	3	H.	
			22	.404								
			24	.522								
	Mean		14 21.9	64.265								
	Mars' sat. 2 = Phobos	250	16 11	. .	67.027	. .	. .	. .	3 A	2	H.	Chron. corr. + 2m.2.
			13		.124							
			14		.240							
			16		.152							
			18		.530							
			21		.613							
			24		.493							
	Mean	. .	16 18.9	64.265	67.311							
	Mars' sat. 2 = Phobos	. .	16 26	. .	67.692	. .	. .	. .	3 A	2	H.	The observations of Mars' satellite 2 of to-night show that this satellite has a period of about $6^h\ 20^m$. I had a good opportunity to compare the brightness of the two satellites. The inner one is the brighter. N. B.—The observations of distance of Mars' satellite 2 on August 20 and August 21 were made with the micrometer set at 72°.0, and are, therefore, along the line of apsides, and are too short. They must be corrected before using.
			30		.536							
			31		.550							
			32		.626							
			34		.620							
			36		.624							
			40		.685							
	Mean	. .	16 34.9	64.265	67.620							
21	Mars' sat. 1 = Deimos	90	10 39	57.935	70.439	10 27	29.6	. .	3 A	2	H.	
			48	.944	.485		29.1					
							28.0					
						32	29.9					
	Mean	. .	10 45.8	57.940	70.462	10 31.8	29.15					
	Mars' sat. 2 = Phobos	70	12 6	. .	67.535	11 57	48.4	. .	3 A	3	H.	
			8		.633		47.4					
			9		.542		47.6					
			10		.554	12 0	47.9					
	Mean	. .	12 10.5	64.265	67.566	12 0.8	47.82					
	Mars' sat. 2 = Phobos	70	12 23	. .	67.398	. .	. .	. .	3 A	3	H.	
			25		.465							
			26		.415							
			27		.370							
	Mean	. .	12 27.5	64.265	67.412							
	Mars' sat. 1 = Deimos	. .	12 35	56.340	71.997	12 30	40.9	. .	3 A*	3	H.	
			41	.390	72.072		41.8					
							41.7					
						34	41.7					
	Mean	. .	12 40.3	56.365	72.035	12 34.3	41.52					
	Mars' sat. 2 = Phobos	70	12 45	61.392	. .	13 11	72.8	. .	3 A	3	H.	The angles of position are doubtful; perhaps not the satellite.
			48	.441			74.1					
			49	.498		14	74.2					
	Mean	. .	12 49.6	61.444	64.265	13 14.8	73.70					
	Mars' sat. Phobos	. .	13 5	62.060	. .	. .	. .	. .	3 A	3	H.	
			7	.081								
			8	.067								
	Mean	. .	13 9.0	62.069	64.265							

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
ıg. 21	**MARS' white spot** . .	. .	. .	. .	. .	13 27	138.8	. .	3 A	3	H.	At 14^h, Professor EASTMAN and I both saw the outer satellite with the 9½-inch Equatorial. Its mag. must be about 13.
	MARS' sat. 1 = Deimos	70	14 4 17	55.899 .931 .991 56.019	72.586 .484 .605 .470	13 58 14 1	48.3 48.4 48.3 48.6	. .	3 A	3	H.	
	Mean	. .	14 12.8	55.960	72.536	14 1.8	48.40					
	MARS' sat. 2 = Phobos	252	15 3 6 8 11	. .	66.851 66.972 67.074 67.151	15 16 18	38.1 40.6	. .	3 A	3	H.	
	Mean	. .	15 9.3	64.265	67.012	15 19.3	39.35					
	MARS' sat. 2 = Phobos	252	15 21 23 29 31	. .	67.461 .486 .535 .614	15 35 37	44.8 43.8	. .	3 A	3	H.	
	Mean	. .	15 28.3	64.265	67.524	15 38.3	44.30					
	MARS' sat. 2 = Phobos	252	15 41 43 45 48	. .	67.621 .726 .680 .670	. .	. .	. .	3 A	3	H.	
	Mean	. .	15 46.5	64.265	67.674							
	MARS' sat. 1 = Deimos	60	16 0 5	56.270 .249	72.237 .269	15 52 56	55.8 56.0 55.1 55.9	. .	3 A	3	H.	Parallel, 30°.23. Chron. corr. + $2^m.3$.
	Mean	. .	16 4.8	56.260	72.253	15 56.3	55.70					
	MARS' sat. 2 = Phobos	240	16 18 20 21 22	. .	67.649 .628 .611 .595	16 10 13	54.4 56.2	. .	3 A	3	H.	To-night I see that the plane of the orbit of the inner satellite must be inclined like that of the outer one. Correct distances of satellite 2 before using.
	Mean	. .	16 22.5	64.265	67.621	16 13.8	55.30					
24	**MARS**	. .	. .	. .	. .	. .	. .	. .	.	.	H.	Strong moonlight. A star of 11th mag. precedes MARS 51^s, and is $3'$ north at 12^h 10^m. This is the only object that can be ALEXANDER's satellite. Images very poor. Clouds. At 13^h 10^m, the star precedes MARS $48^s.5$ and is a fixed star. The inner satellite barely visible, I think, at 13^h 20^m. Cloudy from 13^h 25^m to 15^h. The clouds continue.
26	**MARS' sat. 2 = Phobos**	250	10 35 39 40 42	. .	67.754 .839 .768 .830	10 23 27 29	48.0 48.2 47.0	. .	3 A	2	H.	Cloudy. Observations made through thin clouds.
	Mean	. .	10 41.9	64.265	67.798	10 29.0	47.73					
	MARS	. .	. .	. .	. .	. .	. .	. .	.	.	H.	Clouds. Nothing within a minute of time on either side that can be ALEXANDER's object.
	MARS' white spot . .	160	. .	. .	. .	12 48	131.7	. .	3 A	2	H.	Thin clouds.
	MARS' sat. 1 = Deimos	80	12 56 13 5	56.860 .829 .798	71.688 .824 .756	12 49 52	38.4 38.1 36.6 36.6	. .	3 A	3	H.	
	Mean	. .	13 3.3	56.829	71.756	12 53.2	37.42					

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m.	r.	r.	h. m.	°	°				
Aug. 26	Mars' sat. 1 = Deimos	75	14 16 27	56.028 .049 .063	72.527 .571 .664	14 11 14	42.4 43.4 42.8 43.2	. .	5 A	2	H.	
	Mean	. .	14 24.2	56.047	72.587	14 15.2	42.95					
	Mars' sat. 2 = Phobos	70	14 37 42	61.138 .151	67.508 .511	14 30 34	48.7 47.2 47.6 49.0	. .	5 A	2	H.	The image of Mars blazing, and the inner satellite faint.
	Mean	. .	14 42.2	61.144	67.510	14 34.7	48.12					
	Mars' sat. 2 = Phobos	40	15 33 35	62.050 .006	. .	15 29 31	66.9 66.4	. .	3 A	2	H.	Faint.
	Mean	. .	15 36.7	62.028	64.265	15 32.7	66.65					
	Mars' sat. 1 = Deimos	70	15 44 48	55.816 .800	72.733 .787	15 38 41	49.5 49.9 49.8 49.6	. .	3 A	2	H.	Parallel, 30°.23. Chron. corr. + 2°.7. The image of Mars blazing to-night. The inner satellite fainter than the outer one. At 15^h 55^m, there is no star within 6′ of Mars that can be Alexander's satellite. The eye-piece 3 A shows the satellite better to-night than 5 A.
	Mean	. .	15 48.7	55.808	72.760	15 42.2	49.70					
27	Mars' sat. 2 = Phobos	230	10 26 27	. .	67.259 .259	10 18 19	59.8 59.7	. .	3 A	2	H.	Faint.
	Mean	. .	10 29.3	64.265	67.259	10 21.3	59.75					
	Mars' sat. 1 = Deimos	230	10 40 48	58.072 .094 .275	70.599 .461 .340	10 33 36	66.5 66.9 67.8 67.3	. .	3 A	2	H.	
	Mean	. .	10 46.8	58.147	70.467	10 37.3	67.12					
	Saturn's ring . . .	95	. .	. .	. .	13 0	25.30	. .	3 A	3	H.	I can see through the openings of the ring on each side the ball to-night quite out to the inner edge of the ring.
	Titan	80	13 9.8	60.434	68.022	13 3.3	36.40	. .	3 A	3	H.	
	Mars' sat. 2 = Phobos	70	13 20 26	60.924 .917 .920	67.576 .569 .552	13 15 18	45.4 45.4 46.9 46.6	. .	3 A	4	H.	
	Mean	. .	13 25.8	60.920	67.566	13 19.3	46.08					
	Mars' white spot . .	160	. .	. .	. .	13 33.9	132.0	. .	3 A	3	H.	At 13^h 30^m the inner satellite was plainly seen with Mars in the center of the field.
28	Mars' sat. 1 = Deimos	260	10 39 46	56.273 .274 .241	72.010 .087 .162	10 34 37	39.6 39.3 39.6 39.3	. .	3 A	4	H.	The outer satellite visible with Mars in the center of the field 12-13 mag.
	Mean	. .	10 45.3	56.263	72.086	10 38.3	39.45					
	Mars' sat. 1 = Deimos	250	12 26 35	55.492 .520 .654 .568	72.825 .888 .910 .924	10 20 23	46.9 46.4 46.4 46.8	. .	3 A	4	H.	Chron. corr., $+2^m.8$.
	Mean	. .	12 33.3	55.558	72.887	10 24.3	46.62					

TE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
77.		°	h. m.	r.	r.	h. m.	°	°				
g. 28	MARS' sat. 2 = Phobos	70	12 42 50	60.915 .961 .937 .910	67.500 .528 .456 .436	12 37 40	54.2 53.0 53.2 54.4	. .	3 A	4	H.	
	Mean	. .	12 48.8	60.931	67.480	12 41.3	53.70					
	MARS' white spot . .	160	. .	. .	. .	13 4	130.6	. .	3 A	3	H.	
	SATURN's ring . . .	95	. .	. .	. .	13 13	25.45	. .	3 A	3	H.	Opening of ring on each side of ball well seen. To-night I have observed the two MARS satellites with MARS in the center of the field, the outer satellite at preceding elongation is of the 12th mag. Observed two stars preceding MARS for ALEXANDER, but both proved to be fixed stars. Looked carefully for the DRAPER-HOLDEN satellite, but could not find it.
30	MARS' sat. 2 = Phobos	70	10 19 27	60.932 .890 .892	67.630 .696 .578	10 14 17	47.6 47.6 47.6 48.6	. .	3 A	2	H.	
	Mean	. .	10 25.8	60.905	67.635	10 18.3	47.85					
	MARS' sat. 1 = Deimos	70	10 35 45	55.665 .661 .680 .670	72.732 .760 .780 .812	10 30 33	49.2 49.3 49.5 49.7	. .	3 A	3	H.	Seeing becoming poor. Clouded up at 12^h 15^m. Chron. corr. + 2^m.8.
	Mean	. .	10 42.8	55.669	72.771	10 34.3	49.42					
31	MARS' sat. 1 = Deimos	100	. .	. . .	. . .	. .	. .	. .	3 A	.	H.	It cleared off at 11^h 45^m, and gave a glimpse of the outer satellite; then clouds.
pt. 1	MARS' sat. 1 = Deimos	240	10 46 11 2	56.971 57.035 .095 .244	71.540 .531 .220 .323	10 40 43	61.6 61.4 61.0 60.2	. .	3 A	2	H.	Thin clouds at times.
	Mean	. .	10 56.9	57.086	71.403	10 44.4	61.05					
	MARS' sat. 2 = Phobos	250	12 16 20	60.658 .716	67.749 .772	12 11 14	50.0 49.8 50.6 50.4	. .	3 A	2	H.	
	Mean	. .	12 20.9	60.687	67.760	12 15.4	50.20					
	MARS' sat. 1 = Deimos	220	12 30 36	58.871 59.212	69.694 .579	12 26 28	74.4 75.0	. .	3 A	2	H.	The outer satellite fainter than the inner one at 12^h 30^m. Images blazing and observation difficult of outer satellite at 12^h 30^m.
	Mean	. .	12 35.9	59.041	69.636	12 29.9	74.70					
	MARS' sat. 1 = Deimos	200	. .	. .	. .	13 38 41	90.8 90.0	. .	3 A	1	H.	Images became very bad, and measures of distance given up; p is very uncertain. Parallel, 30°.23. On going outside found sky covered with thin clouds. Chron. corr. + 2^m.9.
	Mean	. .	. .	. .	. .	13 42.4	90.40					
2	MARS' sat. 2 = Phobos	250	11 29 38	60.802 .927 .949 61.033	67.826 .578 .655 .649	11 22 25	52.9 52.8 55.4 54.0	. .	3 A	2	H.	Image of MARS blazing and satellite faint. T = 62°.0.
	Mean	. .	11 36.4	60.928	67.677	11 26.4	53.78					
	MARS' sat. 1 = Deimos	260	11 47 55	56.414 .374 .214	72.274 .170 .325	11 41 44	38.0 37.8 38.6 39.4	. .	3 A	2	H.	
	Mean	. .	11 53.9	56.334	72.256	11 45.4	38.45					

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	REMARKS.
1877.		°	h. m.	r.	r.	h. m.	°	°				
Sept. 2	MARS' sat. 1 = Deimos	250	13 19	55.735	72.949	13 14	45.0	. .	3 A	3	H.	T = 61°.0.
				.650	.942		44.0					
				.598	72.917		44.2					
			28	.630	73.004	16	45.0					
	Mean	. .	13 26.4	55.653	72.953	13 17.9	44.55					
3	MARS' sat. 2 = Phobos	250	10 14	60.871	67.819	10 5	49.2	. .	3 A	2	H.	
			19	.880	.768		50.9					
							50.5					
						8	50.2					
	Mean	. .	10 19.4	60.876	67.793	10 9.4	50.20					
	MARS' sat. 1 = Deimos	40	10 45	60.140	68.425	10 40	83.1	. .	3 A	2	H.	Very faint.
			50	.163	.499		83.6					
							84.1					
						43	84.1					
	Mean	. .	10 50.4	60.151	68.462	10 44.4	83.72					
	MARS' white spot . .	160	. .	. .	. .	13 6	129.7	. .	3 A	3	H.	
	MARS' sat. 2 = Phobos	70	13 16	61.410	67.238	13 10	35.7	. .	3 A	2	H.	T = 58°.0. A bad image of MARS to-night and satellite faint.
				.276	.315		36.4					
			23	.248	.429		37.2					
						14	37.5					
	Mean	. .	13 22.4	61.321	67.327	13 14.9	36.70					
4	MARS' sat. 1 = Deimos	70	10 46	55.715	72.813	10 40	45.0	. .	3 A	2	H.	
				.754	.862		45.2					
				.721	.836		45.5					
			11 1	.645	.810	44	45.1					
	Mean	. .	10 56.7	55.709	72.830	10 45.2	45.20					
	MARS' sat. 2 = Phobos	70	12 30	61.054	67.580	12 25	42.7	. .	3 A	3	H.	At 12^h 40^m the satellites are very nearly of equal brightness. The inner one is therefore decidedly the brighter. The magnitudes I estimate to be 12 and 13.
			36	60.969	.536		42.4					
							41.8					
						28	42.8					
	Mean	. .	12 36.2	61.011	67.558	12 29.7	42.42					
	MARS' white spot . .	170	. .	. .	. .	12 50	130.6	. .	3 A	3	H.	
	MARS' sat. 2 = Phobos	70	13 6	61.130	67.540	13 0	48.9	. .	3 A	3	H.	At 13^h 30^m haze or river fog made the satellite invisible. Chron. corr. + $3^m.2$.
			10	.102	.549	. .	50.6					
							52.0					
						4	53.6					
	Mean	. .	13 11.2	61.116	67.544	13 5.2	51.27					
8	MARS	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	Sky partially clear at times. Light clouds put out the satellite. 12^h to 13^h clouded up.
9	MARS' sat. 1 = Deimos	85	9 54	56.753	71.644	9 47	35.5	. .	3 A	2	H.	
				.750	.680		36.0					
				.680	.739		35.9					
			10 4	.696	.754	50	35.4					
	Mean	. .	10 2.6	56.720	71.704	9 52.1	35.70					
	MARS' sat. 1 = Deimos	75	11 55	55.858	72.738	11 50	44.3	. .	3 A	2	H.	Chron. corr. + $3^m.6$.
				.763	.770		44.2					
				.859	.714		43.9					
			12 5	.853	.690	53	43.3					
	Mean	. .	12 3.6	55.833	72.728	11 55.1	43.92					
	MARS' white spot . .	160	. .	. .	. .	12 14	133.9	. .	3 A	2	H.	

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
877.		°	h. m.	r.	r.	h. m.	°	°				
pt. 9	**MARS' sat. 1 = Deimos**	70	12 52 13 0	55.761 .784 .846 .851	72.781 .750 .704 .811	12 46 49	47.7 48.7 49.0 48.4	. .	3 A	3	H.	Parallel, 30°.23. Inner satellite at preceding elongation about 11½; hazy; SATURN very tremulous.
	Mean	. .	12 59.6	55.810	72.761	12 51.1	48.45					
13	**MARS**	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	Partially clear at 9 o'clock; completely cloudy at 11^h.
14	**MARS' sat. 2 = Phobos**	70	9 56 10 0	61.002 60.985	67.448	9 51 55	43.8 42.3 42.4 44.3	. .	3 A	3	H.	Cord broke to water valve. Very good seeing for a few minutes. The white spot near south pole always looks like a depression.
	Mean	. .	10 1.9	60.993	. .	9 56.9	43.20					
	MARS' sat. 2 = Phobos	70	10 32 36	61.276 .379	67.167 .190	10 27 30	52.8 53.1 53.9 54.4	. .	3 A	3	H.	
	Mean	. .	10 37.9	61.328	67.179	10 32.4	53.55					
	MARS' sat. 1 = Deimos	80	10 44 49	57.111 .069	71.398 .348	10 38 42	34.2 33.7 33.4 33.5	. .	3 A	3	H.	Chron. corr. + $3^m.9$. Haze; clouds. At 10^h the inner satellite brighter than the outer one.
	Mean	. .	10 50.4	57.090	71.373	10 43.9	33.70					
15	**MARS**	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	At 9^h inner satellite near following elongation; outer satellite in $p = 230°$; images extremely bad and measures deferred.
	MARS' sat. 1 = Deimos	220	10 7	64.270	68.620	10 0 2	80.1 79.4 81.0 81.8	. .	3 A	2	H.	Single distance; haze.
	Mean	. .	. .	. .	. .	10 5.0	80.58					
	MARS' white spot . .	160	. .	. .	. .	12 49	137.8	. .	3 A	3	H.	Chron. corr. + $4^m.0$. At 13^h entirely cloudy.
16	**MARS' sat. 1 = Deimos**	250	10 15 23	55.968 .954 .895 .944	72.548 .639 .477 .608	10 9 12	42.3 42.7 42.7 42.6	. .	3 A	2	H.	
	Mean	. .	10 23.2	55.940	72.568	10 14.7	42.58					
	MARS' white spot . .	160	. .	. .	. .	10.32	141.8	. .	3 A	2	H.	Blurred images.
	MARS' sat. 2 = Phobos	250	11 17 11 26	61.044 60.981 .960 .978	67.467 .575 .567 .580	11 11 11 15	39.2 39.1 39.8 40.6	. .	3 A	3	H.	
	Mean	. .	11 25.7	60.991	67.547	11 17.2	39.68					
	MARS' white spot . .	160	. .	. .	. .	11 34	140.5	. .	3 A	3	H.	
	MARS' sat. 1 = Deimos	240	12 41 50	56.330 .340 .355 .475	72.230 .283 .116 .276	12 36 39	52.9 52.2 52.2 52.8	. .	3 A	3	H.	Chron. corr. + $4^m.2$. The white spot near the south pole of MARS appears to be a depression or cavity.
	Mean	. .	12 49.7	56.375	72.226	12 41.7	52.52					
20	**MARS**	. .	23 37	. .	. .	. .	. .	. .	400	.	Hn.	The inner satellite easily visible following MARS by about 1 diameter. Moon about 6° distant and clouds. With occulting bar.
			0 25	. .	. .	. .	. .	. .	400	.	Hn.	Outer satellite seen south of planet.
20	**Satellite of NEPTUNE** .	. .	14 10	62.528	64.261	. .	. .	. .	6 A	1	Hn.	Parallel, 30°.23. Setting = 158°.6.
	Satellite of NEPTUNE .	. .	. .	. .	. .	14 53	250.4	. .	6 A	1	Hn.	Stopped by fog.

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. Sept. 21	**Mars'** sat. 2 = Phobos	70	11 8 14	61.729 .680	66.914 .903	11 5 7	55.0 55.9	. .	3 A	1	H.	
	Mean	. .	11 11.6	61.704	66.908	11 5.7	55.45					
	Mars' sat. 1 = Deimos	250	11 22 30	56.198 .250 .272 .265	72.341 .400 .319 .293	11 16 20	42.8 42.1 42.2 41.9	. .	3 A	2	H.	Very bad images to-night. Chron. corr. + $0^m.6$.
	Mean	. .	11 26.6	56.246	72.338	11 18.6	42.25					
22	**Mars'** sat. 2 = Phobos	70	9 39 45	61.229 .211	67.350 .337	9 31 37	48.8 48.0 48.4 48.0	. .	3 A	2	H.	
	Mean	. .	9 42.7	61.220	67.343	9 34.7	48.30	. .				
	Mars' white spot . .	160	. .	. .	. .	9 58	140.5	. .	3 A	2	H.	At $12^h 30^m$ much fog.
23	**Mars'** sat. 1 = Deimos	70	9 1 11	56.413 .360 .296 .326	72.119 .148 .188 .126	8 57 9 0	42.5 42.6 43.1 43.1		3 A	3	H.	
	Mean	. .	9 6.7	56.349	72.145	8 59.2	42.82					
	Mars' white spot . .	160	. .	. .	. .	9 25	139.1	. .	6 A	3	H.	
	Mars' sat. 2 = Phobos	250	11 42 45	61.180 .191	67.388 .386	11 37 39	36.9 37.0 36.2 36.9	. .	3 A	3	H.	
	Mean	. .	11.44.2	61.185	67.387	11 38.7	36.75					
	Mars' outer satellite = Deimos.	. .	8 30 32.5 38		71.701 .950 .968 .880	. . . .	. . . .	. . .	6 A .	. .	n. .	Following **Mars**. Difference of right ascension.
	Mean	. .	8 34	64.265	71.875							
	Mars' outer satellite = Deimos.	. .	8 44 49.5		65.929 .970 .998 .928	. . . .	. . . .	. . . .	6 A .	. .	Hn. .	Difference of declination. Watch corr. − 21^s.
	Mean	. .	8 46	64.265	65.958							
	Saturn's ring . . .	95	. .	. .	. .	10 44	25.10	. .	3 A	3	H.	
	Mars' sat. 1 = Deimos	60	13 27 36	58.502 .638 .675 .672	70.090 69.906 69.884 70.077	13 21 24	62.8 63.7 62.8 62.6	. .	3 A	3	H.	Satellite faint.
	Mean	. .	13 32.2	58.622	69.989	13 23.2	62.98					
24	**Mars**	. .	. .	. .	. .	. .	. .	. .	400	.	.	$10^h 40^m$–$10^h 50^m$, Washington time. Satellite 1 preceding bright, I should think n from 11.5 magnitude. Easil with **Mars** in the field. Sat following readily seen. Di from center of **Mars** about 50' nearly so bright as Satellite 1 As for the other objects: I faint pected something in $p=4$ It produced no sharply-defin pression on my eye. Had the effect of a very faintly illum body with sizeable disk. Di within 50"–70". I could no wire on it for measurement, a not look long enough in that rant to pronounce decisively w there was anything there or **Todd.**

E.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
4	**MARS**	. .	. .	. .	. .	. .	. .	. .	.	.	.	Sept. 24d.4, about 10h Washington mean time. Examined **MARS** with eye-piece 400 (CLARK) containing occulting bar. Could see the inner satellite preceding the planet about 10″ distant. Caught a glimpse of it once with **MARS** in the open field. Saw the outer satellite following the planet and a little south, I think. The distance from the limb of the planet was about 30″, roughly estimated. It appeared to be considerably fainter than the inner one, but about as easily seen on account of the greater distance. Could see nothing else near the planet in the few minutes I was looking, though only examined the following side closely.—PAUL.
	MARS' sat. 2 = Phobos	250	11 3 10	61.071 .111 .101 .094	67.549 .547 .511 .483	10 56 59	41.7 41.2 40.8 41.0	. .	3 A	3	H.	
	Mean	. .	11 7.3	61.094	67.522	10 58.3	41.18					
	MARS' sat. 1 = Deimos	100	11 20 29	59.116 .069 59.022 58.940	69.411 .434 .372 .464	11 14 17	17.4 17.7 16.5 17.0	. .	3 A	3	H.	
	Mean	. .	11 25.3	59.037	69 420	11 16.3	17.15					
	MARS' white spot . .	160	. .	. .	. .	11 35	135.9	. .	400	3	H.	Parallel, 27°.15. Chron. corr. +0m.8.
	MARS	. .	. .	. .	. .	. .	. .	. .	400	.	.	At 8h 40m examined preceding side of **MARS**. Outer satellite was near its western elongation, and plainly visible with **MARS** also in the field. Looked closely between this and the planet for a third satellite, but could see none, though the planet was hid by occulting bar.—PAUL.
	MARS' sat. 1 = Deimos	250	9 20 29	57.250 .260 .183 .231	71.192 .284 .260 .195	9 16 18	52.9 52.4 52.3 52.2	. .	3 A	4	H.	
	Mean	. .	9 25.3	57.231	71.233	9 17.8	52.45					
	MARS' sat 2 Phobos	260	9 38 45	61.181 .134 .205	67.286 .395 .414	9 33 36	34.9 34.4 34.5 35.1	. .	3 A	4	H.	
	Mean	. .	9 42.3	61.173	67.365	9 35.3	34.72					
	MARS' white spot . .	160	. .	. .	. .	9 52	134.4	. .	3 A	4	H.	Chron. corr. + 0m.8. Parallel, 27°.15.
	SATURN	. .	. .	. .	. .	. .	. .	. .	.	.	H.	At 10h 26m, chron. time. A moon of SATURN just above preceding edge of ring, at right angles to axis of ring.
	MARS' sat. 1 = Deimos	230	12 30 36	60.186 .353 .356	68.238 .164 .179	12 19 24	346.4 345.8 347.9 344.8	. .	400	3	H.	
	Mean	. .	12 33.8	60.298	68.194	12 22.3	346.22					

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. Sept. 25	Mars	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	September 20–24. I am satisfied that the satellite suspected by Dr. Draper and myself at Hastings, on August 26 and 27, does not exist; that is, it seems certain that no satellite half as bright as 2 lies between 70" and 90" at elongation. I should have stopped all search on definitely reaching this conclusion. On September 22, at 9h 10m, on the preceding side of Mars suspected a point at (afterwards altered to "towards") elongation about 2 diameters distant. At 9h 15m, Professor Hall came and began work. At 10h 30m, could not see anything there. At 8h 30m on September 24, s very faint but stellar; seeing steady, but air not very clear. See diagram.
24	Mars	. .	10 26	64.3	68.88	. .	. .	. .	400	.	Hn.	Very rough measure.
25	. . . .	. .	8 5	59.0	64.3	. .	. .	. .	400 & 6 A	.	Hn.	Uncertain; 2 measures very hurried; first the best. Air not thoroughly transparent, but images very steady.
			8 28	59.8	64.3	. .	. .	. .	.	.	.	Good, comparatively, to the others.
											Hn.	Seeing bad. Hall and Paul looked carefully and saw nothing there. Frisby is not sure, but made a sketch showing a suspected point at 8h 35m, then carefully examined this suspected point for a few minutes and concluded that it was not real, as it could not be seen afterwards.
26	Mars	. .	7 17	64.3	69.94	. .	. .	. .	400	.	Hn.	Very rough; sky hazy; images tolerably steady.
			7 25	64.3	70.55	. .	. .	. .	400	.	Hn.	This measure is only worth recording, as it shows I was after the same object as before.
			7 35	64.3	69.70	. .	. .	. .	400	.	Hn.	Very doubtful.
	Mars' white spot . .	160	. .	. .	. .	9 0	130.85	. .	3 A	2	H.	
	Mars' sat. 2 = Phobos	250	9 34	64.250	67.214	9 29	50.5	. .	3 A	3	H.	
							50.7					
							50.4					
						32	49.7					
	Mean	. .	. .	. .	. .	9 31.4	50.32					
	Mars' sat. 1 = Deimos	260	11 7	64.250	71.470	11 1	33.2	. .	3 A	2	H.	Haze.
							32.9					
							32.6					
						4	31.9					
	Mean	. .	. .	. .	. .	11 3.4	32.65					
29	Saturn's ring . . .	95	. .	. .	. .	9 40	22.07	. .	3 A	2	H.	
30	Mars	. .	7 30	. .	. .	. .	. .	. .	400	.	Hn.	I see a very faint object at s, which remains, after moving the tangent screw, in R. A. It is very near the line from the center of Mars to 2.
			7 52	59.42	64.25	. .	. .	. .	400	.	Hn.	Tolerably good. Put on 6 A eye-piece. 2 is much harder to see with this, and s could not be seen for some time, but finally remains, after moving tangent screw in right ascension.
			8 7	59.91	64.25	. .	. .	. .	6 A	.	Hn.	
			8 14	59.52	64.25	. .	. .	. .	400	.	Hn.	Not so good as 1st measure. s is decidedly past 2.
			8 35	58.97	64.25	. .	. .	. .	400	.	Hn.	Seeing worse. This is the poorest of the 3 measures with this eye-piece.

TE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
77. t. 30	**Mars' sat. 1 = Deimos**	250	8 48	56.812	71.642	8 43	43.6	. .	3 A	2	H.	
				.725	.640		44.1					
				.776	.686		43.6					
			59	.800	.695	46	43.8					
	Mean	. .	8 54.7	56.778	71.666	8 45.7	43.78	. .	.	.	.	Micrometer removed.
	Ll. 5133	320	. .	62.726	65.779	23.2	164.8	. .	3 A	2	H.	Images very blazing. Parallel = 31".4.
1	**Mars**	. .	. .	. .	. .	. .	. .	. .	400	.	Hn.	Seeing steady, but I think the sky is beginning to be a little thick.
			7 37	64.25	69.23	. .	. .	. .	400	.	Hn.	Doubtful. I am not absolutely sure z is there, but suspect it in this place.
				64.25	68.52	. .	. .	. .	400	.	Hn.	Time not taken.
			7 55	64.25	68.59	. .	. .	. .	400	.	Hn.	A little better, but still very doubtful.
			8 3	64.25	68.70	. .	. .	. .	400	.	Hn.	Tolerably good. At $8^h\ 3^m$, z was very nearly on the horizontal wire of the micrometer, which was 2" to 3" (carefully estimated) north of Mars' north limb.
			8 9	64.25	68.43	. .	. .	. .	400	.	Hn.	
			. .	. .	. .	. .	. .	. .	.	.	Hn.	I find that z is just as far south of the wire as Mars' north limb is. Hence at $8^h\ 9^m$ its co-ordinates are 42" and 11".7 = (Mars' semidiameter). This makes it distant from Mars' center $s = 43''.5$; $p = 54^\circ.4$.
	Saturn's ring . . .	95	. .	. .	. .	10 9	26.22	. .	3 A	3	H.	
	Mars' white spot . .	160	. .	. .	. .	10 16	130.5	. .	3 A	3	H.	
	Mars' sat. = Deimos	260	10 26	. .	69.620	10 22	23.8	. .	3 A	3	H.	Chron. corr. + $1^m.2$.
					.635	23	24.8					
	Mean		10 27.2	64.250	69.628	10 23.7	24.30					
	Mars' sat. 2 = Phobos	250	11 32	61.397	67.300	11 26	42.7	. .	3 A	2	H.	
			36	.250	.213		43.8					
							44.2					
						29	44.0					
	Mean	. .	11 35.2	61.323	67.256	11 28.7	43.68					
	Mars' sat. 1 = Deimos	260	11 45	57.510	70.758	11 39	32.6	. .	3 A	2	H.	
				.577	.836		33.0					
			54	.610	.779		32.9					
						43	32.4					
	Mean	. .	11 50.9	57.632	70.791	11 42.4	32.72					
	Lalande 5133 . . .	320	. .	62.709	65.774	1 0	165.8	. .	3 A	2	H.	
	Mars	. .	13 30	. .	. .	. .	. .	. .	.	.	.	$p = 35^\circ$, $s = 20''$. On first looking at about $13^h\ 30^m$ thought I saw a faint object a little north and east of the outer satellite. Afterward the seeing grew so poor that I could not be sure of it, though I thought I saw it again once or twice. Did not have good seeing long enough to make sure of the object satisfactorily. Should say the position of the faint object, if there was any, referred to the outer satellite.—Paul.
2	**Mars' sat. 1 = Deimos**	40	8 1	58.769	69.468	7 51	. .	. .	3 A	3	H.	Satellite very faint. This observation belongs to a fixed star. See my remarks at $12^h\ 55^m$.
			11	59.001	.351							
						56						
	Mean	. .	. .	58.885	69.409	7 55	95.1					
	Mars' star	. .	8 15	57.931	. .	. .	. .	. .	3 A	3	H.	Can be seen with Mars in the field. This object proves to be the outer satellite.
			9 39	59.171								

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1877. Oct. 2	MARS' white spot . .	160	. .	. .	. .	8 28	131.4	. .	3 A	3	H.	The first object observed on this date proved to be a fixed star. The satellite was carried near it, within a few seconds, and seemed a little brighter than this star. The real satellite was so bright that I supposed it to be a fixed star, and so lost a good observation.
	MARS' outer satellite.	60	9 51 56	58.411 .	70.050	9 46 48	. .	. .	3 A	2	H.	Probably this is the star again.
	Mean	. .	9 54.9	. .	. .	9 48.4	65.7					
	HYPERION	270	10 12	64.265	86.987	10 7	28.00	. .	3 A	3	H.	
	SATURN'S ring . . .	95	. .	. .	. .	10 28	26.40	. .	3 A	3	H.	
	MARS	. .	12 23	64.245	70.13	. .	. .	. .	400	.	Hn.	Seeing steady, and pretty good measures of z_1. Two objects, z_1 and z, of which z_1 is the fainter. The drawing is perhaps wrong in putting z too close to the line of MARS' equator.
	MARS	. .	12 30 39	64.245 64.245	69.53 69.60	. .	. .	. .	.	.	Hn.	Measures of z both good. N. B.—The question mark on the first figure is not meant to question the existence of z, but to express doubt as to which, z_1 or z, was the object I expected to reach elongation at 13h. The object marked 2 is not 2 but a star.
	MARS	. .	. .	. .	. .	. .	. .	. .	.	.	.	With bar. Examined the following side of MARS at 12h 45m, mean time. Could see nothing but a faint star about 90" from the planet in position angle 90°.—PAUL.
	MARS	. .	. .	. .	. .	. .	. .	. .	.	.	H.	With bar. The position of faint star given by P. is nearly correct. I can see nothing between this star and the planet, or in this region; seeing at first good, after 5 or 10 minutes became poorer.
			13 10	. .	. .	. .	. .	. .	.	.	Hn.	The seeing is certainly worse, 12h 55m.
			13 0	. .	. .	. .	. .	. .	.	.	H.	G. Anderson looked and could see nothing in the region of HOLDEN'S z and z_1.
4	MARS	. .	. .	. .	. .	. .	. .	. .	400	.	Hn.	Air apparently very clear but extremely unsteady.
			9 58	64.245	69.54	. .	. .	. .	.	.	.	The object measured is nearly, if not quite, down (north) to the line *ab*; that is, it has about the same declination as the north limb of the planet.
			10 3	64.245	69.97	. .	. .	. .	.	.	Hn.	The object is certainly past elongation, but not so far north as *ab*. Better measure than the other, but both are hurried to give Prof. HALL time to examine MARS. I make the estimate that from z north to *ab* is ¼ MARS' semidiameter, but this is hardly worth recording, as the planet is so unsteady. Another faint object interior to this. I think I can certainly say that I can see this object when MARS is placed behind different parts of the occulting bar. It is so faint that I cannot be perfectly sure that I follow it, as the eye-piece is moved, but I get it again in the new position. The only other eye-piece with which I can see well, 6 A, is at Kahler's for repairs. At 10h 30m the seeing is worse.

TE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
77.		°	h. m.	r.	r.	h. m.	°	°				
5	SATURN's ring . . .	. .	. .	. .	. .	7 17	26.13	. .	400	2	Hn.	Saw a small object at 7^h 55^m on the preceding side of MARS. Saw nothing else. About 8^h 55^m saw a faint object nearly the same distance on the following side.—FRISBY. 8^h 14^m to 8^h 30^m. Saw nothing on the preceding side of MARS but satellite 2. Tried to see if I could get any false images from MARS or from SATURN with 400 and the bar, but could not.—HOLDEN.
	MARS' sat. 1 = Deimos	260	8 47	57.090	71.419	8 41	42.8	. .	3 A	2	H.	
				.000	.389		43.2					
				.060	.351		42.4					
			57	.050	.430	8 45	42.6					
	Mean	. .	8 53.7	57.050	71.397	8 44.7	42.75					
	MARS' white spot . .	160	. .	. .	. .	9 4	133.3	. .	3 A	2	H.	
	MARS' sat. 2 = Phobos	90	10 32	61.773	66.700	10 24	30.4	. .	3 A	2	H.	
			36	.723	.821		30.3					
							34.1					
						29	32.2					
	Mean	. .	10 35.7	61.748	66.760	10 28.2	31.75					
	MARS' sat. 2 = Phobos	80	10 43	61.631	66.920	10 38	37.6	. .	3 A	2	H.	
			48	.633	.894		38.9					
							38.5					
						41	37.6					
	Mean	. .	10 47.7	61.632	66.907	10 41.2	38.15					
6	MARS	. .	7 15	. .	69.81	. .	. .	. .	400	.	Hn.	With MARS behind the following side of bar; limb just visible.
			7 26	. .	69.40	. .	. .	. .	400	.	Hn.	With MARS toward the preceding edge of the occulting bar.
			7 32	. .	69.64	. .	. .	. .	6 A	.	Hn.	With the eye-piece in different positions; that is, MARS hidden more than at first.
			7 38	. .	69.84	. .	. .	. .	. .	.	Hn.	
			7 40	. .	. .	. .	. .	. .	. .	.	Hn.	Still saw 2 on the wires after the eye-piece had been rotated.
6	TITAN	250	8 26	61.901	66.594	8 22	57.10	. .	3 A	2	H.	
	MARS' white spot . .	160	. .	. .	. .	9 28	130.4	. .	3 A	2	H.	
	MARS' sat. 2 = Phobos	70	10 12	61.558	67.092	10 6	46.4	. .	3 A	2	H.	Chron. corr. + 1^m.7.
				.450	.008		46.6					
			18	.379	.160		46.9					
						9	45.7					
	Mean	. .	10 16.7	61.462	67.087	10 9.2	46.40					
	Satellite of NEPTUNE .	20	11 53	63.046	65.436	11 41	102.1	. .	6 A	1	Hn.	Clear.
	Object near NEPTUNE		12 13	64.25	63.715	12 1	332.7	. .	6 A	.	H.	Looked at NEPTUNE at 12^h 40^m; saw a faint object about 0°; distant 7″, as near as I could judge. Seeing very poor.—ANDERSON.
9	MARS' sat. 1 = Deimos	230	7 29	58.687	69.615	7 21	61.7	. .	3 A	2	H.	
			32				60.1					
							62.8					
						25	60.9					
	Mean	. .	7 32.4	. .	. .	7 24.9	61.38					
	MARS' white spot . .	160	. .	. .	. .	7 43	134.4	. .	3 A	2	H.	Chron. corr., + 1^m.9.
	SATURN's ring . . .	. .	. .	. .	. .	9 24	25.65	. .	400	4	Hn.	The shadow of the ball on the ring is well seen and is convex toward SATURN's center.

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m.	r.	r.	h. m.	°	°				
Oct. 9	Mars	. .	. .	. .	. .	. .	. .	. .	400	.	Hn.	9^h to 9^h 30^m, light passing clouds; 9^h 30^m to 10^h, hazy but steady; 10^h to 10^h 30^m, very unsteady. No object seen preceding or following Mars within 60". 9^h 30^m south preceding Mars from the limb 30" is a small star.
11	. . . .	. .	. .	. .	. .	. .	. .	. .	400	1	Hn.	6^h 50^m to 7^h 17^m no object near Mars. At 8^h seeing very bad; the same at 9¼ o'clock; same at 10¼ o'clock.
12	Mars' sat. 1 = Deimos	70	. .	. .	. .	8 23 27	47.8 48.1	. .	3 A	1	H.	Very poor images; thin clouds and sky hazy; object invisible. At 8^h 55^m images very bad.
	Mean	. .	. .	. .	. .	8 27.0	47.95					
	Hyperion	90	9 18	48.956	64.252	9 8	32.38	. .	3 A	2	H.	Chron. corr. + $2^m.0$.
13	Mars' white spot . .	160	. .	. .	. .	7 20	139.9	. .	3 A	3	H.	
	Hyperion	90	8 49	64.252	83.554	8 44	30.05	. .	3 A	2	H.	
	Titan	300	9 1	61.056	67.508	8 57.5	3.95	. .	3 A	2	H.	
	Japetus	250	9 14	64.252	80.988	9 8	51.72	. .	3 A	2	H.	
	Saturn's ring . . .	95	. .	. .	. .	9 19	26.18	. .	3 A	2	H.	
	Mars' white spot . .	160	. .	. .	. .	9 48	135.1	. .	3 A	2	H.	Parallel, 31°.37.
	Saturn's ring . . .	95	. .	. .	. .	10 47	25.60	. .	400	2	Hn.	Chron. corr. + $2^m.1$.
	Mars	. .	. .	. .	. .	. .	. .	. .	. .	.	Hn.	11^h to $11\frac{1}{2}^h$ nothing seen on preceding side. Satellites 1 and 2 on following side, but both faint. Mars very red, as it seen through a fog, and somewhat unsteady.
14	Mars' white spot . .	160	. .	. .	. .	7 33	139.4	. .	3 A	3	H.	Haze, but image very steady.
	Satellite of Saturn .	250	7 44	62.864	65.584	7 40	50.8	. .	3 A	3	H.	
	Satellite of Saturn .	100	7 54	62.856	65.631	7 48	10.8	. .	3 A	2	H.	
	Hyperion	90	8 5	42.590	64.252	8 0	28.38	. .	3 A	2	H.	Extremely faint; haze.
	Titan	80	8 19	59.764	68.745	8 14	42.25	. .	3 A	3	H.	
	Saturn's ring . . .	95	. .	. .	. .	8 25	26.00	. .	3 A	3	H.	
	Japetus	250	8 35	64.252	76.747	8 30	56.90	. .	3 A	3	H.	Parallel, 31°.35. Haze to-night, but images steady.
	Hyperion	90	8 58	64.252	85.924	8 53	28.38	. .	3 A	2	H.	Chron. corr. + $2^m.1$.
	Mars	. .	. .	. .	. .	. .	. .	. .	400	4	Hn.	9^h 40^m to 10^h. Nothing seen on following side of Mars except sat. 1, which is quite faint from haze, although near elongation. Mars very steady.
	Saturn's ring . . .	. .	. .	. .	. .	9 57	25.80	. .	400	4	Hn.	
	Saturn's satellite . .	. .	. .	. .	. .	. .	. .	. .	400	.	Hn.	9^h 42^m. At this time the satellite seems exactly up. It is on the micrometer wire set at 115°.7. 9^h 49^m 30^s. I should think it a little past. 9^h 49^m 53^s. Decidedly past.
15	Enceladus	275	7 17	60.853	67.651	7 13	27.35	. .	3 A	4	H.	
	Tethys	95	7 26	59.735	68.785	7 21	26.85	. .	3 A	4	H.	
	Dione	275	7 35	58.929	69.573	7 29	24.0	. .	3 A	3	H.	
	Rhea	275	7 48	55.904	72.575	7 40	26.02	. .	3 A	3	H.	
	Japetus	240	7 56	55.731	64.252	7 53	67.50	. .	3 A	3	H.	
	Titan	90	8 8	64.252	74.504	8 3	31.85	. .	3 A	3	H.	
	Hyperion	95	8 14	64.251	86.317	8 11	27.10	. .	3 A	3	H.	
	Mars' sat. 2 = Phobos	70	8 42 48	61.626 .831 .858 .789	. .	8 37 39	50.2 50.9 51.3 51.8	. .	3 A	3	H.	
	Mean		8 47.2	61.776	64.252	8 40.2	51.05					

ATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Mierom. II (largest reading.)	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
377.		°	h. m.	r.	r.	h. m.	°	°				
t. 15	Mimas	90	9 9	61.585	64.252	9 4	28.8	. .	3 A	3	H.	
	Mars	. .	8 27	60.2	. .	. .	. .	. .	.	.	Hn.	I see nothing on the preceding side but 2, which is faint. I had only one suspicion of any object and set the wire as above, but it was no object I could verify.
	Mars' sat. I = Deimos	260	9 26 29		70.043 .020	9 16 19	34.4 33.8 34.6 34.3	. .	3 A	3	H.	The satellites nearly of equal brightness.
	Mean	. .	9 29.7	64.252	70.031	9 19.7	34.28					
	Saturn's ring . . .	95	. .	. .	. .	11 11.7	25.68	. .	.	.	Hn.	
	Mimas	95	. .	. .	. .	11 11.7	95.68	. .	400	3	Hn.	
16	Japetus	205	8 5	59.143	69.326	7 59	95.95	. .	3 A	2	H.	Chron. corr. + 2^m.3.
	Saturn's ring . . .	95	. .	. .	. .	10 39	25.65	. .	400	1	Hn.	
	Mimas	90	. .	. .	. .	10 30	25.9	. .	400	1	Hn.	Mimas very faint, but seems to be just at elongation.
	Mimas	. .	. .	. .	. .	10 49	. .	. .	400	1	Hn.	Mimas is considerably past elongation and the position angle is probably too small.
	Mimas	. .	. .	. .	. .	11 0	. .	. .	400	1	Hn.	Clouds.
17	Mimas	90	6 54	61.612	64.245	6 48	31.35	. .	3 A	3	H.	
	Japetus	170	7 11	64.245	68.960	7 4	149.17	. .	3 A	2	H.	Very faint, through clouds.
	Saturn's ring . . .	95	. .	. .	. .	7 20	26.27	. .	3 A	3	H.	
	Mars' white spot . .	160	. .	. .	. .	7 43	141.5	. .	3 A	3	H.	
18	Japetus	125	6 47	64.250	71.833	6 42	181.80	. .	3 A	4	H.	
	Saturn's ring . . .	95	. .	. .	. .	6 56	26.10	. .	3 A	3	H.	
	Mimas	95	. .	. .	. .	6 56	26.1	. .	3 A	3	H.	Mimas near elongation at 6^h 56^m. Too much moonlight to measure distance. All the satellites visible but Hyperion.
	Mars' white spot . .	160	. .	. .	. .	7 8	141.6	. .	3 A	4	H.	
	Mars' white spot . .	160	. .	. .	. .	9 20	139.5	. .	3 A	4	H.	
	Venus' star . . .	270	. .	. .	. .	6 5	210.9	. .	400	.	Hn.	Distance est. 3'. All very uncertain measures. I am confident of an object near this place.
	Saturn's ring . . .	. .	. .	. .	. .	9 49	25.70	. .	400	3	Hn.	Mimas not seen at 9^h 40^m.
	Satellite of Neptune .	20	10 31	63.230	65.347	10 18	108.5	. .	6 A	1	Hn.	
	Object near Neptune	350	. .	. .	. .	10 29	150.0	. .	6 A	.	Hn.	Moonlight. s estimated = 6". Chron. corr. + 2^m.4.
			12 0	. .	. .	. .	. .	. .	.	.	Hn.	Sky very much thicker, and the satellite is not well seen. There is no small star to be seen following Neptune.
23	Saturn's ring . . .	95	. .	. .	. .	7 5	26.15	. .	3 A	2	H.	
	Mars' white spot . .	160	. .	. .	. .	7 12	144.0	. .	3 A	2	H.	Very poor images. Chron. corr. + 2^m.6.
24	Saturn's ring . . .	95	. .	. .	. .	7 35	26.07	. .	3 A	4	H.	

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m.	r.	r.	h. m.	°	°				
Oct. 24	Mars' white spot . .	160	. .	. .	. .	7 52	143.2	. .	3 A	4	H.	Too hazy for satellites. Chron. corr. + 2ᵐ.7.
31	Mars' sat. 1 = Deimos	70	7 59 8 1 8 10	58.918 58.915 59.155 59.018	. .	7 46 51	53.0 54.4 51.4 52.0	. .	400	2	H.	Chron. corr. + 2ᵐ.7. Mars' outer satellite extremely faint, and observed with difficulty. G. Anderson sees this satellite. Parallel = 31°.25.
	Mean	. .	8 6	59.001	64.250	7 50.7	52.70	. .				
	Satellite of Neptune .	230	9 27 32 36	63.028 .019 .012	65.550 .430 .516	9 16 24	60.3 59.8 61.3 60.4	. .	6 A	2	Hn.	Chron. corr. + 2ᵐ.2.
	Mean	. .	9 34	63.020	65.499	9 22	60.45					
Nov. 2	Mars	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	Sky cleared up at 6½ hours, but images extremely unsteady and blazing. At 8ʰ, images too poor to observe; high wind.
											Hn.	9ʰ 20ᵐ to 9ʰ 30ᵐ, images too poor for measures of Mars and Saturn.
3	Mars and Saturn .	350	6 38.1	36.177	94.382	6 31.6	143 82	. .	2 A	2	H.	Saturn to Mars. Chron. corr. + 2ᵐ.6.
4	Satellite of Neptune .	40	11 4	62.639	65.957	10 50	88.4	. .	6 A	2	Hn.	
	Star *n. f.*	70	11 20	58.167	64.25	11 12	42.1	. .	6 A	2	Hn.	Chron. corr. 0ᵐ.0. Object pretty faint
	Star *n. p.*	340	11 25	56.206	64.25	11 15	318.4	. .	6 A	2	Hn.	Object brighter than satellite, but not much.
6	Hyperion	95	7 39	64.259	84.775	7 32.5	25.90	. .	3 A	2	H.	Faint.
	Titan	110	7 52	59.708	68.791	7 47	10.52	. .	3 A	2	H.	Micrometer working very hard.
	Satellite of Neptune .	225	10 52	62.823	65.682	10 37	66.9	. .	6 A & 5 A	2	Hn.	Chron. corr. + 3ᵐ.5.
	Satellite of Neptune?	335	. .	. .	. .	11 0	127.0	. .	5 A	.	Hn.	Images quite unsteady. $s = 8''$. Stars within 2′, and many small stars within 10′.
7	Mars	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	Sky not clear but images steady. I cannot see the outer satellite.
	Titan	250	7 1	61.277	67.144	6 55	52.95	. .	3 A	2	H.	
			7 5	. .	. .	. .	. .	. .	.	.	H.	Hyperion not visible though near elongation. The sky must be thick.
			7 50	. .	. .	. .	. .	. .	.	.	.	I think I can barely glimpse Hyperion.
	Satellite of Neptune .	210	10 36	62.668	65.952*	10 28	87.5	. .	5 A	3	Hn.	* Reduced for 65ʳ.852.
	Satellite of Neptune .	. .	10 48	62.634	65.844	. .	. .	. .	.	.	Hn.	Through fog. The position circle is too stiff to measure angles with. Chron. corr. + 0ᵐ.6.
12	Mars	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	Parallel = 33°.6, approx. Very bad images at 7ʰ 50ᵐ, and no satellite visible. Images better at 8ʰ 30ᵐ, but no satellite visible.
	Satellite of Neptune .	240	10 44	62.696	65.761	10 25	72.5	. .	5 A	3	Hn.	The satellite is very faint, and the bisections are made with difficulty. Parallel = 33°.6.
13	Satellite of Neptune .	210	10 25	62.707	65.743	10 7	94.7	. .	5 A	3	Hn.	Chron. corr. + 0ᵐ.9. Angles of position more uncertain than they otherwise would be, as the position circle does not move smoothly.
			10 50	. .	. .	. .	. .	. .	.	.	.	Strong fog all around southern horizon.
	Aldebaran and faint comp.	100	2 50	64.249	67.279	. .	. .	. .	400	3	Hn.	Comes very faint. Object-glass dewed. Discovered by S. W. Burnham. Difference of R. A,
	Aldebaran and faint comp.		3 0	63.218	64.249	. .	. .	. .	400	3	Hn.	Difference of Declination. Chron. corr. + 0ᵐ.9.

TE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
77.		°	h. m.	r.	r.	h. m.	°	°				
19	MIMAS	. .	6 55	. .	. .	. .	. .	. .	400	.	H.	MIMAS near following elongation, I think, but too faint for measures.
	NEPTUNE	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	Satellite just faintly visible in a dark field, but too much cloud and moonlight for measures.
27	HYPERION	95	6 44	43.936	64.260	6 34	28.12	. .	3 A	2	H.	Chron. corr. + $1^m.7$.
	JAPETUS	300	6 58	54.743	73.743	6 52	11.98	. .	3 A	2	H.	Images very much blurred. Parallel = 32°.95.
29	HYPERION	95	6 31	50.274	64.250	6 25	25.00	. .	3 A	2	H.	
30	HYPERION	100	6 27	55.885	64.237	6 21	20.20	. .	3 A	2	H.	Very faint images. T = 25°. Chron. corr. + $1^m.7$.
	TITAN	310	7 38	62.040	66.496	7 33	355.68	. .	3 A	2	H.	T = 24°.0.
2	SATURN's ring . .	95	. .	. .	. .	6 26	27.75	. .	3 A	3	H.	Chron. corr. + $1^m.8$.
	HYPERION	. .	. .	. .	. .	. .	. .	. .	.	.	.	HYPERION is just visible in $p = 250°$ and $s = 35''$ (by estimation). This is the least distance I have ever seen this satellite.
	θ^1 Orionis	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	$11^h\ 30^m$ and 13^h. Memoranda made on chart.
3	HYPERION	265	. .	. .	. .	. .	. .	. .	3 A	.	H.	Micrometer wires broken out. HYPERION well seen just in edge of halo.
6	HYPERION	275	6 48	64.158	86.369	6 35	29.68	. .	3 A	2	H.	Clouds; chron. corr. + $2^m.2$. Parallel nearly 33°.60. There is a fainter object north following and distant some 10″.
7	RHEA (above ring) .	120	6 13	62.335	65.909	6 8	13.6	. .	3 A	3	H.	
	ENCELADUS . . .	95	6 25	61.097	67.125	6 18	26.5	. .	3 A	3	H.	
	HYPERION	275	6 41	64.149	86.540	6 35	28.52	. .	3 A	3	H.	HYPERION very bright to-night.
	SATURN's ring. . .	95	. .	. .	. .	6 48	28.20	. .	3 A	3	H.	Parallel, 33°.60. Chron. corr. + $2^m.1$.
	Electra	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	On second of wires B.
	Merope	. .	4 1	36.535	94.971	. .	. .	. .	5 A	2	Hn.	Aperture 26^{in}. Difference of Dec.
	Sirius (Marth star) .	115	. .	64.149	71.293	6 4	8.7	. .	3 A	3	H.	
	Sirius	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	The image fair, and the sky pretty clear at first. Both the Marth star and star south in preceding quadrant seen, and Marth star observed; the Lassell star very bright. It is pretty certain that Tempel of Florence has not seen the two faint stars. The Clark companion very fine.
	PROCYON	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	The image steady, but sky has become thick. Only G. Anderson's companion seen. Clouding up at $13^h\ 50^m$.
8	HYPERION	275	5 52	43.107	64.152	5 47	27.48	. .	3 A	2	H.	
	TITAN	100	6 4	59.951	68.292	5 58	13.40	. .	3 A	2	H.	
	SATURN's ring. . .	95	. .	. .	. .	6 9	28.45	. .	3 A	2	H.	Chron. corr. + $2^m.1$.
	G. C. 768	. .	. .	. .	. .	. .	. .	. .	2 A	.	Hn.	Differences of R. A. and Dec. Coincidence, $64^r.154$. The images being too unsteady for micrometer measures, I examined Tempel's nebula round *Merope* Pleiadum. The nebula is better defined on its following side near *Merope*, and as the following side is followed toward the south the borders become more ill-defined. These borders were drawn on Tempel's map by me 1875, Oct. 25, with the comet seeker, and they are correct as there drawn. The

DATE.	Object observed.	Estimated position angle.	Washington Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Time.	Position Circle.		Eye-piece.	Image.	Observer.	REMARKS.
							Ver. I.	Ver. II.				
1877.		°	h. m.	r.	r.	h. m.	°	°				
Dec. 8	G. C. 768—Cont'd .	. .	. .	. .	. .	. .	. .	. .	.	.	.	preceding side of the nebula is ill-defined, and is better drawn in the sketch of 1875, Oct. 25, than to-night. Toward the north the nebula extends further than it is drawn by Tempel, or than I have before seen it. The star 21 Pleiadum appears also to have nebulosity immediately about it and extending to the *south* so as to join that about *Merope*. That is, there is an oval shape vacant of nebulosity on the line between *Merope* and 21 Pleiadum. The edge of the nebula passes exactly through a small star (16 mag.). This star is not laid down in Tempel's chart. The coordinates of this star referred to *Merope* were measured.
				41.59	56.67	. .	. .	. .	.	.	.	The following edge also passes between the two stars at a distance of one-third their mutual distance from the preceding one. The coordinates of this point (no star here) are 182".3 and 136".7.
				45.830	50.413	. .	. .	. .	2 A	.	Hn.	Differences of R. A. and Dec. Coincidence, $64^r.154$. The nebula extends north about as far as a small star, but is much fainter here. It is not certain that this star is the limit, but it is not far from it. The coordinates of this star are 84".9 and 294".3.
				55.610	34.565	. .	. .	. .	2 A	.	Hn.	Differences of R. A. and Dec. Measures a little uncertain on account of poor illumination of wires. Coincidence, $64^r.154$.
9	TITAN	240	6 3	61.094	67.238	5 58	50.40	. .	3 A	3	H.	
	HYPERION	275	6 13	45.984	64.154	6 8	26.00	. .	3 A	3	H.	
	SATURN's ring. . .	95	. .	. .	. .	6 18	28.38	. .	3 A	3	H.	Parallel, 33°.65; chron. corr. + $2^m.1$.
11	*Merope*	. .	1 43	35.324	93.765	. .	. .	. .	3 A	2	Hn.	Aperture 26^{in}. Difference of Dec. Electra on 1st of wire B.
	Merope	. .	1 55	35.314	93.765	. .	. .	. .	3 A	2	Hn.	Aperture 4^{in}. Stars more unsteady. Difference of Dec.
14	HYPERION	80	7 22	64.152	72.432	7 17	39.58	. .	3 A	2	H.	Faint.
15	HYPERION	90	6 53	64.150	77.293	6 47	34.75	. .	3 A	2	H.	Very faint. Chron. corr. + $2^m.4$.
	SATURN's ring. . .	95	. .	. .	. .	7 2	28.85	. .	3 A	3	H.	
19	SATURN's ring. . .	95	. .	. .	. .	6 52	28.45	. .	3 A	3	H.	Parallel, 33°.65; chron. corr. + $2^m.6$.
20	MARS	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	Looked at MARS at 6¼ o'clock and at 8. Could see no black notch nor any marking around the edge of planet. Seeing good at 6¼; rather poor at 8 o'clock.
28	MARS	. .	. .	. .	. .	. .	. .	. .	3 A	.	H.	At 7¼ hours no notch visible on the limb of this planet.
	Aldebaran (Burnham's companion).	105	. .	61.078	67.248	2.3	193.10	. .	3 A	2	H.	14th and 15th mag. Cloudy after 9^h 30^m.—HN.
31	SATURN's ring. . .	95	. .	. .	. .	6 23	28.10	. .	3 A	2	H.	Cloudy. Chron. corr. + $3^m.25$. Observations were made on this day for position of instrument.
	Merope	. .	4 32	35.329	93.747	. .	. .	. .	3 A	3	Hn.	Electra on 1st of wire B. Annular aperture 3^{in} in width. A disk covering the central part of the glass.

ATE.	OBJECT.	Sid. Time.	Δa		Sid. Time.	Micrometer.	Coincidence.	$\Delta\delta$		Eye-piece.	Image.	Observer.	REMARKS.
			Wire I.	Wire II.									
877.		h. m. s.	s.	s.	h. m. s.	r.	r.	r.	′ ″				
eb. 9	Comet *a* . . .	14 33 34.1	+ 19.60	+ 19.50	14 45 32	36.779	64.082	27.303	+4 31.6	2 A	.	Hn.	Comet follows north of star, setting 123°.4. Observation difficult. Comet moving north, setting 33°.4. Star is D. M. +2°, 3304.
10	Comet *a* . . .	13 42 35.3	+ 30.76	+ 30.63	16 40 17	60.263	64.10	3.837	+ 38.16	2 A	.	Hn.	At 13^{h} 42^{m} star preceding and north of comet, setting 123°. At 16^{h} 40^{m} star south of comet, setting 33°. Star is Lalande 31707.
12	Comet *a* . . .	13 43 50.8	+ 65.40	+ 65.97	13 53 9.5	61.04	64.11	3.07	+ 30.54	.	.	Hn.	Comet follows and is north of star D. M. +16°, 3211, and precedes a small double star 15″ 9-10 mag., which is 5′ north of it.
13	Comet *a* . . .	13 53 55.8	+ 33.27	+ 33.23	14 12 10.1	52.82	64.11	11.29	+1 52.31	2 A	.	Hn.	Comet follows north of star D. M. + 22°, 3173; T = 21°.
17	Comet *a* . . .	13 54 55.4	+ 89.40	+ 89.45	14 10 37	51.78	64.11	12.33	+2 2.66	2 A	.	Hn.	Comet follows north of star Lalande 33849, setting 213°.2.
	2 Comp. stars .	. . .	. .	. .	. . .	56.30	93.85	. .	. .	.	.	.	Lalande 33849 follows Σ 2305 35^{s}.3, and is north of it 6′ 13″.6.
ur. 10	Comet *a* . . .	8 20 1.2	−158.06	−162.19	8 40 16.4	45.190	72.473	27.283	−4 31.38	2 A	3	Hn.	Comet precedes and is south of both stars D. M. +55, 868, and 869. R. A. compared with both stars. Declination with following star only.
30	Comet *a* . . .	8 46 37.2	+ 31.98	+ 32.88	9 2 22	57.38	93.86	46.48	−6 25.1	2 A	.	Hn.	Comet south of star on 1st of wire B, probably D. M. +46°; 910 or 907.
r. 10	Comet *b* . . .	17 49 44.2	+ 45.30	+ 45.10	17 48 18.8	44.73	30.12	14.61	+2 25.34	2 A	.	Hn.	Comet follows north of star D. M. + 21°, 4724; comet pretty bright, visible to naked eye. Daylight interfered with careful notes on its appearance.
11	Comet *b* . . .	17 54 2.0	+ 49.38	+ 49.32	18 18 5.4	130°.0	. .	. .	. .	.	.	.	Parallel 215°.3. D. M. + 22°, 4611.
	D. M. + 22°, 4614	17 32 31.1	+ 49.15	. .	. . .	46^{r}.00	10.073	35.927	−5 56.9	2 A	.	Hn.	D. M. 4614 is compared with 4611 in R. A., but with the comet in declination, and it therefore precedes the comet 0^{s}.20 and is north of it 5′ 56″.9 at 17^{h} 32^{m} 31^{s}.1.
12	Comet *b* . . .	17 27 28.0	+ 38.03	+ 38.00	17 17 23.1	53.50	64.11	10.61	+1 45.5	2 A	.	Hn.	Comet north following star D. M. + 24°, 4575.
12	Radius of *Coma* .	16 14 . .	. .	. .	. . .	. .	. .	. .	. .	.	.	.	Put fixed wire *A* on nucleus and movable wire tangent to the following side of *Coma*. The daylight is already coming on, and the above measure is ¼ smaller than a setting made just before, but not verified.
14	Comet *b* . . .	17 25 14.4	+192.80	. .	. . .	. .	. .	. .	. .	2 A	.	Hn.	Star D. M. +26°, 4404 precedes and is south of comet.
		17 27 22.1	− 38.53	. .	. . .	. .	. .	. .	. .	.	.	.	Star follows comet.

DATE.	OBJECT.	Sid. Time.	Δα		Sid. Time.	Micrometer.	Coincidence.	Δδ		Eye-piece.	Image.	Observer.	REMARKS.
			Wire I.	Wire II.									
1877.		h. m. s.	s.	s.	h. m. s.	r.	r.	r.	′ ″				
Apr. 14	Comet and following star.	. . . .	. .	. .	17 36 53	91.60	64.11	27.49	+4 33.5	2 A	.	Hn.	Star south of comet.
15	Meteor. . . .	12 45	. .	. .	. . .	. .	. .	. .	. .	.	.	Hn.	From an altitude of 30° ± vertically downward in the northeast. 1st magnitude, green; motion tolerably slow. Its path cannot be better described as the observer was occupied with other things.
22	Comet *b* . . .	. . . .	. .	. .	. . .	. .	. .	0.405	4.03	.	.	Hn.	From single observation.
	Diam. of nucleus.	. . . .	. .	. .	. . .	. .	. .	0.598	5.95	.	.	Hn.	From double observations.
	Coma	. . . .	. .	. .	. . .	. .	. .	5.48	. .	.	.	.	Preceding radius.
	Coma	. . . .	. .	. .	. . .	. .	. .	5.52	. .	.	.	.	Following radius. Both measures in parallel.
	Coma	14 40	. .	. .	. . .	. .	. .	. .	. .	.	.	Hn.	Just visible to the naked eye.
		15 0	. .	. .	. . .	. .	. .	. .	. .	.	.	Hn.	Twilight begins to be visible. Moon just setting.
23	Comet *b* (nucleus)	. .	. .	. .	. . .	64.489	64.113	0.376	3.74	2 A	.	Hn.	Needs no correction for thickness of wire. Better measures than those of April 22.
	Comet *b* . . .	16 16 46.7	+ 63.40	+ 63.20	. . .	. .	. .	. .	. .	.	.	.	W^2 698–699.
	Comet *b* . . .	. . . .	+ 43.90	+ 43.76	. . .	. .	. .	. .	. .	.	.	.	W^2 710–711.
	Comet *b* . . .	. . . .	+ 34.68	+ 34.64	. . .	. .	. .	. .	. .	.	.	.	W^2 715.
	Comet and 2d star	. . . .	. .	. .	16 32 18.7	52.596	64.113	11.517	+1 54.6	2 A	.	Hn.	Comet north of star.
May 2	Zodiacal light .	9 30	. .	. .	. . .	. .	. .	. .	. .	2 A	.	Hn.	The zodiacal light was quite strong though diffuse, and in it I noticed a much brighter streak, perhaps 1° broad. Professor HALL and myself at $9^h 45^m$ also saw a second and somewhat fainter streak and not so broad; at 10^h it has been hidden by horizontal clouds.—HOLDEN.
	Comet *b* . . .	17 28 59.7	+ 40.70 + 7.10 + 17.82	. .	. . .	. .	. .	. .	. .	.	.	.	D. M. +62°, 2208.
	Comet and 1st star	. . . .	. .	. .	17 44 47	41.479	64.113	22.634	+3 45.2	.	.	.	Comet north of star.
	Comet and 2d star	. . . .	. .	. .	. . .	56.523	64.113	7.590	+1 15.5	.	.	.	Comet north of star.
	Comet *b* . . .	17 33 50	. .	. .	. . .	. .	. .	. .	. .	.	.	.	Comet passed north of 2d star, which is $20^r.437$ = + 3′ 23″.31. north of 1st star.
6	Comet *b* . . .	15 40 59.5	+415.5	+416.6	. . .	. .	. .	. .	. .	.	.	Hn.	D.M. + 70°; 1337.
	D. M. + 70°, 1337, and small star.	15 52 13.2	+ 13.40	+ 13.70	. . .	. .	. .	. .	. .	.	.	.	This star follows D.M. + 70°; 1337 $6^m 49^s.5$.
	Comet and 2d star	. . . .	. .	. .	16 11 23.3	43.608	64.114	20.506	+3 24.5	.	.	.	Comet follows north of star.
	Σ 3052 and 2d star	. . . .	. .	. .	. . .	34.161	93.854	59.693	+9 53.8	.	.	.	Σ 3050 follows south of 2d star. Comet 13′ 18″.3 north of Σ 3052.

DATE.	OBJECT.	Sid. Time.	Δα Wire I.	Δα Wire II.	Sid. Time.	Micrometer.	Coincidence.	Δδ		Eye-piece.	Image.	Observer.	REMARKS.
1877.		h. m. s.	s.	s.	h. m. s.	s.	s.	r.	′ ″				
May 9	Comet *b* . . .	17 41 26.8	−274.67	. .	17 25 12.2	55.987	93.854	37.867	− 6 16.8	. .	.	Hn.	Comet precedes mean of 2 stars and is south of them.
	Comet and O. Arg. N. 937.	. . . .	. .	. .	17 2 35.2	8.41	93.85	85.44	+14 10.0	. .	.	. .	Comet north of star.
10	Comet *b* . . .	13 16 42.8	+ 95.96	+ 96.16	13 40 0.0	71.14	64.11	7.03	− 1 9.9	. .	.	Hn.	All these observations through clouds. The comet is tolerably bright, condensation toward the center, but no nucleus. Comet south of star.
12	Comet *c* . . .	12 35 41.0	− 1.73	. .	. . .	. .	. .	. .	. .	. .	.	Hn.	D. M. + 79°.88.
		12 40 1.8	− 16.29	− 32.63									2 small stars.
		15 36 20.2	−208.79	. .	15 57 10.2	84.607	93.867	9.260	− 1 32.1				O. Arg. N. 3326.
		15 36 20.2	+390.56	. .	. . .	. .	. .	. .	. .	. .	.	. .	Comet precedes and is south of star.
14	Comet *c* . . .	14 59 20.3	+ 22.86	. .	14 36 55.2	31.203	93.867	62.66	−10 23.4	2 A	.	Hn.	D. M. + 80°, 147; comet precedes and is south of star.
15	Comet *c* . . .	13 22 . .	. .	. .	. . .	. .	. .	. .	. .	. .	.	. .	Comet precedes star 55^s ± O. Arg. N. 7479; parallel, 209°.3.
17	Comet *c* . . .	13 39 27.0	+140.07	+140.83	12 42 44.7	69.712	93.870	24.158	− 4 0.3	2 A	.	Hn.	D. M. + 49, 1607.
			+122.27	+123.23									Comet south of star.
			+ 13.77	+ 13.70								.	D. M. + 49, 1608. Comet and this star had the same A.R. at $12^h 44^m 11^s.5$.
18	Comet *c* . . .	13 2 41.3	−195.93	−196.17	12 41 16.4	58.93	94.43	35.50	− 5 53.2	. .	.	. .	O. Arg. N. 7878; comet south of star.
22	Comet *b* . . .	14 12 40.9	− 24.15	. .	14 24 59.2	16.147	93.87	77.721	−12 53.2	. .	.	. .	α compared with D. M. + 71, 439°. δ with D. M. + 71°, 442; comet south of star.
23	Comet *b* . . .	13 32 31.1	+324.24	. .	13 6 9.7	75.896	93.852	17.956	+ 2 58.6	2 A	.	Hn.	Gr. 1400; comet north of star.
		13 37 22.6	−117.53	−115.77									O. Arg. N. 8685. T = 65°.0.
24	Comet *b* . . .	13 26 57.9	+ 18.01	+ 18.02	13 45 44.1	90.21	64.02	25.19	− 4 20.5	2 A	.	Hn.	Comet south of star. D. M. + 68°, 531.
29	Comet *c* . . .	14 7 12.8	− 18.08	− 18.08	13 58 13.4	66.493	64.22	2.273	+ 22.61	2 A	.	Hn.	Comet north of star. D.M. + 36°, 1782; D. M. 36, 1783.
			− 20.04	− 20.04									
31	Comet *c* . . .	13 59 39.5	+ 42.38	+ 42.39	13 47 51.8	70.706	93.86	23.154	+ 3 50.3	2 A	.	Hn.	Comet north of star. Comet *c* compared with a 9th magnitude star which agrees in place (nearly) with D. M. + 34°, 1816. It is preceded $1^s.28$ by a double star, mag. 12–12, distance 0″.87; $p = 100°$ ±, estimated. This double is 2′ ± south of the comparison star. The doubt as to its being D. M. + 34°, 1816, is caused by the failure to find D. M. + 34°, 1812, which is missing, unless it is composed of a wide pair of 10th magnitude stars.
June 1	Comet *c* . . .	13 34 3.6	− 29.44	− 29.39	13 46 52.9	32.368	64.23	31.862	− 5 17.0	2 A	.	Hn.	Comet south of star W^2, 8^h, 435.
18	SATURN . . .	. . . .	. .	. .	. . .	. .	. .	. .	. .	. .	.	. .	At the house, 11th street. I simply record having seen (entirely independently of Professor HALL's observations) the diminution of the brightness of the ring near the ball with a 3½-inch equatorial, magnifying power 175. I did not know that any such thing might be expected; and it must have been quite a I was merely TURN (wit power as

DATE.	OBJECT.	Sid. Time.	Δα		Sid. Time.	Micrometer.	Coincidence.	Δδ		Eye-piece.	Image.	Observer.	REMARKS.
			Wire I.	Wire II.									
1877.		h. m. s.	s.	s.	h. m. s.			r.	′ ″				
June 19	JUPITER sat. I .	14 30 33.9	. .	. .	. . .	. .	. .	. .	. .	. .	.	Hn.	The star reported by Mr. TODD as likely to be occulted by JUPITER precedes JUPITER by about 9ˢ, and is 20″–30″ south of it at 8ʰ 40ᵐ. A star 11th mag. 31ˢ precedes JUPITER will be occulted June 20.
23	Comet *b* . . .	16 17 5.1	+197.20	. .	15 52 51.9	67.148	64.217	2.931	+ 29.16	2 A	.	Hn.	Comet north of star D. M. + 42°, 2023 K.
			+203.58										
			+ 75.16	. .	15 52 51.9	74.375	66.722	7.653	− 1 16.1		.		Comet south of star D.M. + 42°, 2029.
28	Comet *b* . . .	15 33 2.8	+ 95.97	. .	15 50 5.9	53.522	93.84	40.318	− 6 41.1	2 A	.	Hn.	Comet south of star W², 686.
29	Comet *b* . . .	15 19 36.6	− 25.04	− 24.98	. . . .	57.58	93.84	36.26	− 6 0.7	2 A	3, 1	Hn.	Comet south of star W², 762–763. Right ascension observations satisfactory, though taken through clouds. Time lost by chronograph pen failing. No declination observations before 15ʰ 25ᵐ 30ˢ (chronograph pen failed then) and none after 9ʰ 7ᵐ mean time. Too hazy to make a new set in declination. At any rate, the haze had so increased that the observations of Δδ were very poor.
		Mean Time.			Mean Time.								
		h. m.			h. m.								
Aug. 11	JAPETUS . . .	13 23.8	+31.340	+31.323	13 41	68.303	70.482	+2.179	+ 21.68	3 A	3	H.	JAPETUS north, following SATURN. *p* (est.) 90°.
15	TITAN	13 19.3	+13.203	+13.218	13 38	67.093	68.701	−1.608	− 16.00	3 A	3	H.	TITAN south, following SATURN. Cloudy. *p* (est.) 95°.
	JAPETUS . . .	13 19.0	+36.297	+36.304	13 47	66.990	71.753	+4.763	+ 47.38	3 A	3	H.	JAPETUS north, following SATURN. Images unsteady. *p* (est.) 85°.
16	TITAN	12 3.3	+11.841	+11.827	12 31	75.107	76.817	−1.710	− 17.01	3 A	2	H.	TITAN south, following SATURN. *p* (est.) 95°.
	JAPETUS . . .	12 14	+36.980	+36.925	12 43	75.495	70.197	+5.298	+ 52.71	3 A	2	H.	JAPETUS north, following SATURN. *p* (est.) 85°.
17	TITAN	12 10.5	+ 8.756	+ 8.723	12 34	68.437	69.912	−1.475	− 14.67	3 A	2	H.	TITAN south, following SATURN. *p* (est.) 95°.
	JAPETUS . . .	12 14.9	+37.410	+37.364	12 44	68.608	62.748	−5.860	− 58.29	3 A	2	H.	JAPETUS north, following SATURN. *p* (est.) 85°.
18	TITAN	13 13.6	+ 4.210	+ 4.190	. .	. .	. .	. .	. .	3 A	3	H.	No declination observed *p* (est.) 100°. Saw the openings of the ring on each side the ball.
	JAPETUS . . .	13 15	+37.592	+37.591	13 30	72.340	65.959	+6.381	+ 63.48	3 A	3	H.	JAPETUS north, following SATURN. *p* (est.) 85°.
27	JAPETUS . . .	12 33.9	+28.736	+28.699	12 51	60.856	57.321	+3.535	+ 35.17	3 A	3	H.	JAPETUS north, following SATURN. *p* (est.) 85°.
Sept. 22	JAPETUS . . .	11 0.1	−35.105	−35.099	. .	. .	. .	. .	. .	3 A	2	H.	*p* (est.) 270°.
	TITAN	11 1	−10.113	−10.127	. .	. .	. .	. .	. .	3 A	2	H.	*p* (est.) 270°.
23	JAPETUS . . .	10 7.6	−36.093	−36.100	10 28	66.501	70.202	−3.701	− 36.82	3 A	3	H.	JAPETUS south, preceding SATURN. *p* (est.) 270°.
	TITAN	10 8	−12.242	−12.250	10 37	67.170	68.467	+1.297	+ 12.90	3 A	3	H.	TITAN north, preceding SATURN. *p* (est.) 270°.
25	JAPETUS . . .	10 34.7	−37.509	−37.535	10 53	65.936	70.621	−4.685	− 46.61	3 A	3	H.	JAPETUS south, preceding SATURN. *p* (est.) 270°.
	TITAN	10 35	−10.589	−10.596	11 1	66.476	68.382	+1.906	+ 18.96	3 A	3	H.	TITAN north, preceding SATURN. *p* (est.) 275°.

ATE.	OBJECT.	Mean Time.	Δα Wire I.	Δα Wire II.	Mean Time.	Micrometer.	Micrometer.	Δδ	Δδ	Eye-piece.	Image.	Observer.	REMARKS.
877.		h. m.	s.	s.	h. m.	r.	r.	r.	″				
pt. 26	Japetus	10 24.4	−37.842	−37.866	10 42	68.228	73.349	−5.121	− 50.95	3 A	2	H.	Japetus south, preceding Saturn. *p* (est.) 270°.
	Titan	10 25	− 6.905	− 6.908	10 51	66.282	68.053	+1.771	+ 17.62	3 A	2	H.	Titan north, preceding Saturn. *p* (est.) 280°.
29	Japetus	8 53.2	−37.399	−37.412	9 21	60.931	67.104	−6.173	− 61.40	3 A	2	H.	Japetus south, preceding Saturn. *p* (est.) 270°. Cloudy at times.
	Titan	8 54	+ 7.455	+ 7.444	9 31	61.076	61.116	+0.040	+ 0.40	3 A	2	H.	Titan north, following Saturn. *p* (est.) 90°.
t. 1	Japetus	9 24.5	−35.953	−35.985	9 45	66.025	72.704	−6.679	− 66.45	3 A	3	H.	Japetus south, preceding Saturn. *p* (est.) 270°.
	Titan	9 25	+13.056	+13.040	9 55	66.055	67.400	−1.345	− 13.38	3 A	3	H.	Titan south, following Saturn. *p* (est.) 95°.
6	Japetus	8 47.8	−28.399	−28.391	9 5	62.945	70.064	−7.121	− 70.84	3 A	2	H.	Japetus south, preceding Saturn. *p* (est.) 260°.
9	Japetus	8 14.2	−21.522	−21.526	8 29	66.144	72.981	−6.837	− 68.02	3 A	2	H.	Japetus south, preceding Saturn. *p* (est.) 260°.
	Titan	8 14	−12.144	−12.162	8 36	66.072	67.340	+1.268	+ 12.61	3 A	2	H.	Titan south, preceding Saturn. *p* (est.) 275°.
31	Japetus	6 34.2	+33.710	+33.675	6 53	58.407	61.728	+3.321	+ 33.04	3 A	2	H.	Japetus north, following Saturn. *p* (est.) 93°. Images of Saturn unsteady.
v. 6	Japetus	6 59.2	+35.883	+35.896	7 18	61.748	66.376	+4.628	+ 46.04	3 A	2	H.	Japetus north, following Saturn. *p* (est.) 93°.
7	Japetus	6 26.6	+35.430	+35.394	7 46	59.523	65.393	+5.870	+ 58.40	3 A	2	H.	*p* (est.) 93°.
12	Japetus	7 0.6	+29.965	+29.992	7 22	70.956	77.579	+6.623	+ 65.89	3 A	2	H.	Japetus north, following Saturn. *p* (est.) 92°. Images very much blurred and unsteady.
13	Japetus	6 23.1	+28.393	+28.377	6 42	60.866	67.515	+6.649	+ 66.15	3 A	2	H.	Japetus north, following Saturn.
16	Titan	6 31.5	+ 7.504	+ 7.478	6 55	62.496	62.610	+0.114	+ 1.13	3 A	2	H.	Titan north, following Saturn.
	Japetus	6 32	+22.473	+22.449	6 59	55.874	62.436	+6.562	+ 65.28	3 A	2	H.	Japetus north, following Saturn. *p* (est.) 90°. Cloudy.
17	Titan	6 22.0	+10.653	+10.661	6 40	65.992	66.626	−0.634	− 6.31	3 A	3	H.	Titan south, following Saturn. *p* (est.) 96°.
	Japetus	6 22.2	+20.181	+20.206	6 50	59.569	65.996	+6.427	+ 63.94	3 A	3	H.	Japetus north, following Saturn. *p* (est.) 90°.
19	Titan	6 58.1	+12.200	+12.167	7 14	66.017	67.848	−1.831	− 18.21	3 A	2	H.	Titan south, following Saturn. *p* (est.) 95°.
	Japetus	6 58.2	+15.362	+15.347	7 24	59.668	65.795	+6.127	+ 60.95	3 A	2	H.	Japetus north, following Saturn. *p* (est.) 88°.
20	Titan	6 23.4	+10.404	+10.373	6 39	61.564	63.599	−2.035	− 20.24	3 A	2	H.	Titan south, following Saturn.
	Japetus	6 23.4	+12.893	+12.870	6 47	55.628	61.438	+5.810	+57.80	3 A	2	H.	Japetus north, following Saturn. Images much blurred at times.
7	Japetus	7 18.6	−27.733	−27.753	7 38	64.454	65.766	−1.312	− 13.05	3 A	3	H.	Japetus south, preceding Saturn. *p* (est.) 270°.
	Titan	7 19.2	+ 6.614	+ 6.603	7 47	65.532	67.375	−1.843	− 18.33	3 A	3	H.	Titan south, following Saturn. *p* (est.) 98°.
9	Japetus	6 39.8	−30.409	−30.421	6 57	65.704	67.903	−2.199	− 21.88	3 A	3	H.	Japetus south, preceding Saturn *p* (est.) 270°.
10	Japetus	5 53.5	−31.440	−31.416	6 18	65.872	68.515	−2.643	− 26.29	3 A	2	H.	Japetus south, preceding Saturn. *p* (est.) 270°.
	Titan	5 54	− 6.151	− 6.164	6 31	65.351	65.494	−0.143	− 1.42	3 A	2	H.	Titan south, preceding Saturn. *p* (est.) 270°. Poor images, and Hyperion not seen.
12	Japetus	6 12.2	−33.072	−33.060	6 31	66.390	69.909	−3.519	− 35.01	3 A	3	H.	Japetus south, preceding Saturn. *p* (est.) 270°.
	Titan	6 12.6	−11.178	−11.158	6 38	65.013	66.257	+1.244	+ 12.37	3 A	3	H.	Titan north, preceding Saturn. *p* (est.) 278°.
13	Japetus	6 1.3	−33.521	−33.520	6 22	66.974	70.893	−3.919	− 38.98	3 A	2	H.	Japetus south, preceding Saturn. *p* (est.) 270°.
	Titan	6 1.7	−11.067	−11.045	6 31	65.065	66.725	+1.660	+ 16.51	3 A	2	H.	Titan north, preceding Saturn. *p* (est.) 278°. Image of Saturn much blurred. Thin clouds in the sky.
14	Japetus	6 18.8	−33.841	−33.843	6 36	67.405	71.725	−4.320	− 42.97	3 A	3	H.	Japetus south, preceding Saturn. *p* (est.) 268°.
	Titan	6 19.2	− 9.050	− 9.051	6 44	65.314	67.140	+1.826	+ 18.16	3 A	3	H	Titan north, preceding Saturn. *p* (est.) 278°.

DATE.	OBJECT.	Mean Time.	Δα Wire I.	Δα Wire II.	Mean Time.	Micrometer.	Micrometer.	Δδ	Δδ	Eye-piece.	Image.	Observer.	REMARKS.
1877.		h. m.	s.	s.	h. m.	r.	r.	r.	"				
Dec. 15	Japetus . . .	6 13.1	−33.967	−33.939	6 29	62.971	67.584	−4.613	− 45.89	3 A	3	H.	Japetus south, preceding Saturn. *p* (est.) 268°.
	Titan	6 13.5	− 5.624	− 5.616	6 38	59.940	62.638	+2.698	+ 26.84	3 A	3	H.	Titan north, preceding Saturn. *p* (est.) 280°.
19	Japetus . . .	6 19.5	−32.253	−32.296	6 36	65.768	71.532	−5.764	− 57.34	3 A	3	H.	Japetus south, preceding Saturn. *p* (est.) 265°.
	Titan	6 20.2	+10.237	+10.257	6 45	65.360	66.109	−0.749	− 7.45	3 A	3	H.	Titan south, following Saturn. *p* (est.) 95°.
20	Japetus . . .	6 20.8	−27.733	−27.744	6 48	54.646	59.714	−5.068	− 50.42	3 A	3.2	H.	Japetus south, preceding Saturn. *p* (est.) 265°
	Titan	6 21.4	+11.691	+11.694	7 6	59.170	60.495	−1.325	− 13.18	3 A	3	H.	*p* (est.) 95°.

RESULTS OF OBSERVATIONS OF THE SATELLITES OF MARS.

PHOBOS.

DATE.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	REMARKS.
1877.	h. m.	°			h. m.	"				
Aug. 17	16 6	73.0	2	3	16 21	30.81	2	3	H.	
18	11 30	248.8	2	3	11 36	34.65	2	3	H.	
19	11 25	226.8	2	3	11 29	24.07	1	3	H.	
20	13 15	67.1	1	3	13 26	31.94	2	3	H.	These distances measured along the line of apsides, and are too small.
20	. .	. .	.	.	13 56	27.01	2	3	H.	
20	. .	. .	.	.	14 22	19.16	2	3	H.	
20	. .	. .	.	.	16 19	30.30	4	2	H.	
20	. .	. .	.	.	16 35	33.38	4	2	H.	
21	12 1	72.4	4	3	12 10	32.84	2	3	H.	
21	. .	. .	.	.	12 27	31.31	2	3	H.	
21	13 16	46.5	3	1	12 50	28.06	2	3	H.	
21	. .	. .	.	.	13 9	21.85	2	3	H.	
21	15 19	260.9	2	3	15 9	27.33	2	3	H.	
21	15 38	255.9	2	3	15 28	32.42	2	3	H.	
21	. .	. .	.	.	15 46	33.91	2	3	H.	
21	16 14	244.9	2	3	16 23	33.39	2	3	H.	
26	10 29	252.5	3	2	10 42	35.15	2	2	H.	
26	14 35	72.1	2	2	14 42	31.67	2	2	H.	
26	15 33	53.6	2	2	15 37	22.25	1	2	H.	
27	10 21	240.4	2	2	10 29	29.78	1	2	H.	
27	13 19	74.1	4	4	13 26	33.06	3	4	H.	
28	12 41	66.5	4	4	12 49	32.58	4	4	H.	
30	10 18	72.4	4	2	10 .26	33.48	3	2	H.	
Sept. 1	12 15	250.0	4	2	12 21	35.18	2	2	H.	
2	11 26	246.4	4	2	11 36	33.57	4	2	H.	
3	10 9	250.0	4	2	10 19	34.40	2	2	H.	
3	13 15	83.5	4	2	13 22	29.87	3	2	H.	
4	12 30	77.8	4	3	12 36	32.56	2	2	H.	
4	13 5	68.9	4	3	13 11	31.97	2	3	H.	
14	9 57	77.0	4	3	10 2	32.10	1	3	H.	
14	10 32	66.7	4	3	10 38	29.10	2	3	H.	
16	11 17	260.5	4	3	11 26	32.61	4	3	H.	
21	11 7	64.8	2	1	11 12	25.88	2	1	H.	
22	9 35	71.9	4	2	9 43	30.46	2	2	H.	
23	11 39	263.4	4	3	11 44	30.85	2	3	H.	
24	10 58	256.0	4	3	11 7	31.98	4	3	H.	
25	9 35	262.4	4	4	9 42	30.80	4	4	H.	
26	9 31	246.8	4	2	9 35	29.49	1	2	H.	
Oct. 1	11 29	257.7	4	2	11 35	29.51	2	2	H.	
5	10 28	89.6	4	2	10 36	24.93	2	2	H.	
5	10 41	83.3	4	2	10 47	26.23	2	2	H.	
6	10 9	75.0	4	2	10 17	27.97	3	2	H.	
15	8 40	70.3	4	3	8 47	24.63	4	3	H.	

DEIMOS.

DATE.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	REMARKS.
Aug. 11	14 40	59.6	2	3	14 45	70.57	1	3	H.	
16	13 7	71.9	2	3	13 12	80.83	2	3	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF MARS—Continued.

DEIMOS—Continued.

ATE.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	REMARKS.
1877.	h. m.	°			h. m.	"	.			
ug. 17	16 2	85.5	2	3	16 23	63.24	2	3	H.	
18	10 27	251.7	3	.	10 19	82.98	4	.	N.	
18	10 56	244.5	1	.	11 4	81.62	1	.	Ha.	
18	11 48	246.5	4	3	11 56	81.76	2	3	H.	
18	14 33	232.1	4	3	14 40	61.04	2	3	H.	
19	11 41	283.2	2	3	11 51	45.94	2	3	H.	
19	15 44	255.4	4	2	15 52	81.35	3	2	H.	
20	10 29	61.0	3	3	10 34	76.05	1	3	H.	
20	11 57	52.1	4	2	12 8	59.91	2	2	H.	
21	10 32	91.1	4	2	10 46	62.29	2	2	H.	
21	12 34	78.7	4	3	12 40	77.94	2	3	H.	
21	14 2	71.8	4	3	14 13	82.45	4	3	H.	
21	15 56	64.5	4	3	16 5	79.55	2	3	H.	
26	12 53	82.8	4	2	13 3	74.25	3	2	H.	
26	14 15	77.3	4	2	14 24	82.27	3	2	H.	
26	15 42	70.5	4	2	15 49	84.32	2	2	H.	
27	10 37	233.1	4	2	10 47	61.28	3	2	H.	
28	10 38	260.8	4	4	10 45	78.70	3	4	H.	
28	12 24	253.5	4	4	12 33	86.19	4	4	H.	
30	10 34	70.8	4	3	10 43	85.07	4	3	H.	
pt. 1	10 44	238.9	4	2	10 57	71.21	4	2	H.	
1	12 30	225.5	2	2	12 36	52.70	2	2	H.	
1	13 42	209.8	2	1	. .	. .	.	.	H.	
2	11 45	261.8	4	2	11 54	79.20	3	2	H.	
2	13 18	255.7	4	3	13 26	86.05	4	3	H.	
3	10 44	36.5	4	2	10 50	41.34	2	2	H.	
4	10 45	75.0	4	2	10 57	85.16	4	2	H.	
9	9 52	84.5	4	2	10 3	74.53	4	2	H.	
9	11 55	76.3	4	2	12 4	84.03	4	2	H.	
9	12 51	71.8	4	3	13 0	84.31	4	3	H.	
14	10 44	86.5	4	3	10 50	71.04	2	3	H.	
15	10 5	219.6	4	2	10 11	43.28	1	2	H.	
16	10 15	257.6	4	2	10 23	82.71	4	2	H.	
16	12 42	247.7	4	3	12 50	78.84	4	3	H.	
21	11 19	258.0	4	2	11 27	80.04	4	2	H.	
23	8 59	77.4	4	3	9 7	78.57	4	3	H.	
23	13 23	57.2	4	3	13 32	56.54	4	3	H.	
24	11 16	100.1	4	3	11 25	51.64	4	3	H.	
25	9 18	244.7	4	4	9 25	69.65	4	4	H.	
25	12 22	220.9	4	3	12 34	39.28	3	3	H.	
26	11 3	264.5	4	2	11 8	71.83	1	2	H.	
30	8 46	253.4	4	2	8 55	74.05	4	2	H.	
t. 1	10 24	277.1	2	3	10 27	53.51	1	3	H.	
1	11 42	268.7	4	2	11 51	65.45	3	2	H.	
2	9 48	55.7	2	2	9 55	57.89	1	2	H.	
5	8 45	258.7	4	2	8 54	71.36	4	2	H.	
9	7 25	240.0	4	2	7 32	54.36	1	2	H.	
10	8 27	73.45	2	1	. .	. .	.	.	.	
15	9 20	267.08	4	3	9 30	57.30	2	3	H.	
31	7 51	68.55	4	2	8 6	52.22	2	2	H.	

1877.	h. m.	"	
Sept. 23	8 34 8 46	$\Delta\alpha = 75.71$ $\Delta\delta = 16.82$	} HOLDEN.

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN.

MIMAS.

g. 11	11 39.6	94.7	.	3	11 40.6	26.74	1	3	H.	Axis of ring.
17	13 2.1	94.9	.	2	13 3.1	33.91	3	2	H.	Axis of ring, not Mimas.
. 15	9 4.2	92.6	4	3	9 8.7	26.53	2	3	H.	
15	11 11.7	95.68	4	3	. .	. .	.	.	Hn.	
16	10 30.0	95.5	1	1	. .	. .	.	.	Hn.	Very faint.
17	6 47.8	90.0	2	3	6 54.0	26.19	3	3	H.	
18	6 56.4	95.3	1	3	. .	. .	.	.	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

DATE.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight	Observer.	REMARKS.
						ENCELADUS.				
1877.	h. m.	°			h. m.	"				
Aug. 11	11 59.6	95.6	4	3	12 6.6	26.39	2	3	H.	
Dec. 7	6 18.1	97.1	4	3	6 24.6	29.98	2	3	H.	
						TITAN.				
Aug. 10	13 48.1	281.32	4	2	13 58.6	44.09	4	2	H.	
11	11 46.6	81.93	4	3	11 54.1	26.13	2	3	H.	
18	12 37.5	99.47	4	3	12 43.0	64.87	2	3	H.	
27	13 3.3	83.83	4	3	13 9.8	37.84	4	3	H.	
Oct. 6	8 21.7	244.30	4	2	8 26.2	23.34	2	2	H.	
13	8 57.5	297.41	4	2	9 1.1	32.09	2	2	H.	
14	8 13.6	79.11	4	3	8 18.1	44.66	2	3	H.	
15	8 2.7	89.51	4	3	8 8.2	102.00	4	3	H.	
Nov. 6	7 47.0	110.73	4	2	7 52.0	45.19	2	2	H.	
7	6 55.1	248.30	4	2	7 1.0	29.18	2	2	H.	
30	7 33.2	307.27	4	2	7 38.2	22.16	2	2	H.	
Dec. 8	5 58.1	110.20	4	2	6 4.1	41.47	2	2	H.	
9	5 58.1	253.25	4	3	6 2.6	30.56	2	3	H.	
						HYPERION.				
June 18	15 15.8	273.90	4	2	15 22.8	222.77	4	2	H.	
19	15 6.8	274.38	4	2	15 15.8	225.32	4	2	H.	
22	14 55.5	275.55	4	2	15 2.0	141.50	4	2	H.	
23	15 3.1	275.51	2	2	15 7.6	89.98	2	2	H.	Excessively faint.
Aug. 10	14 9.6	92.80	4	3	14 16.1	196.64	4	3	H.	
11	12 53.1	93.43	4	2	12 59.1	218.62	4	2	H.	
Oct. 2	10 7.4	273.40	4	3	10 11.9	226.24	4	3	H.	
12	9 8.0	89.02	4	2	9 18.0	152.17	4	2	H.	
13	8 44.0	91.31	4	2	8 49.5	192.02	4	2	H.	
14	7 59.6	92.98	4	2	8 4.6	215.50	2	2	H.	Extremely faint.
14	8 53.1	92.98	4	2	8 57.6	215.60	2	2	H.	
15	8 11.2	94.26	4	3	8 14.2	219.51	4	3	H.	
Nov. 6	7 32.5	95.35	4	2	7 39.0	204.10	4	2	H.	Faint.
27	6 33.7	94.83	4	2	6 44.2	202.19	4	2	H.	
29	6 24.7	97.95	4	2	6 31.2	139.04	4	2	H.	
30	6 21.2	102.75	4	2	6 26.7	83.09	4	2	H.	Very faint.
Dec. 6	6 35.2	273.92	4	2	6 48.2	220.96	2	2	H.	
7	6 35.1	275.08	4	3	6 41.1	222.74	4	3	H.	
8	5 46.6	276.12	4	2	5 51.6	209.36	4	2	H.	
9	6 7.6	277.65	4	3	6 12.6	180.75	4	3	H.	
14	7 16.7	84.07	4	2	7 21.8	82.37	3	2	H.	Faint.
15	6 47.4	88.90	4	2	6 53.4	130.75	4	2	H.	Very faint.
						JAPETUS.				
June 22	15 8.8	305.88	4	2	15 16.5	90.51	2	2	H.	
23	15 13.6	292.91	4	2	. . .	. .	.	.	H.	
25	14 54.0	280.89	4	2	15 1.5	193.03	4	2	H.	
Aug. 10	14 22.1	94.15	4	3	14 31.1	76.42	4	3	H.	Not JAPETUS.
Oct. 13	9 8.5	249.64	4	2	9 14.0	166.50	4	2	H.	
14	8 29.6	244.46	4	3	8 34.6	124.30	4	3	H.	
15	7 52.7	233.86	4	3	7 56.2	84.77	4	4	H.	
16	7 58.8	205.41	4	2	8 5.3	50.65	3	2	H.	
17	7 3.8	152.19	4	2	7 11.3	46.91	4	2	H.	
18	6 41.9	119.56	4	4	6 46.9	75.44	4	4	H.	
Nov. 27	6 52.2	290.97	4	2	6 58.2	94.51	2	2	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

TITAN.

DATE.	Washington Mean Time.	Δα	Number of measures.	Weight.	Washington Mean Time.	Δδ	Number of measures.	Weight.	Observer.	REMARKS.
1877.	h. m.	s.			h. m.	″				
Aug. 15	13 19.3	+ 13.210	22	2	13 38.0	− 16.00	4	2	H.	
16	12 13.3	11.840	20	2	12 31.0	17.01	5	2	H.	
17	12 10.5	8.740	28	2	12 33.6	− 14.67	5	2	H.	
18	13 13.6	+ 4.200	20	3	. . .	. .	.	.	H.	
Sept. 22	11 0.5	− 10.120	20	2	. . .	. .	.	.	H.	
23	10 8.0	12.246	18	3	10 36.7	+ 12.90	5	3	H.	
25	10 35.1	10.592	20	3	11 1.3	18.96	4	3	H.	
26	10 24.9	− 6.906	20	2	10 51.4	17.62	5	2	H.	
29	8 53.9	+ 7.450	20	2	9 30.6	+ 0.40	5	2	H.	
Oct. 1	9 25.3	+ 13.048	20	3	9 55.2	− 13.38	5	3	H.	
9	8 14.4	− 12.153	18	2	8 35.9	+ 12.61	3	2	H.	
Nov. 16	6 31.5	+ 7.491	24	2	6 55.0	+ 1.13	3	2	H.	
17	6 22.0	10.657	20	3	6 39.5	− 6.35	5	3	H.	
19	6 58.1	12.184	20	2	7 14.2	18.21	5	2	H.	
20	6 23.4	10.389	18	2	6 39.2	20.24	5	2	H.	
Dec. 7	7 19.2	+ 6.608	20	3	7 47.1	18.33	5	3	H.	
10	5 53.9	− 6.158	20	2	6 30.6	− 1.42	5	2	H.	
12	6 12.6	11.168	20	3	6 38.2	+ 12.37	5	3	H.	
13	6 1.7	11.056	22	2	6 30.8	16.51	5	2	H.	
14	6 19.2	9.050	20	3	6 44.3	18.16	5	3	H.	
15	6 13.5	− 5.620	22	3	6 38.4	+ 26.84	5	3	H.	
19	6 20.2	+ 10.247	20	3	6 44.6	− 7.45	5	3	H.	
20	6 21.4	+ 11.692	20	3	7 5.7	− 13.18	5	3	H.	

JAPETUS.

DATE.	Washington Mean Time.	Δα	Number of measures.	Weight.	Washington Mean Time.	Δδ	Number of measures.	Weight.	Observer.	REMARKS.
Aug. 11	13 23.8	+ 31.332	22	3	13 40.5	+ 21.68	5	3	H.	
15	13 19.0	36.300	20	2	13 48.5	47.38	5	2	H.	
16	12 13.9	36.980	20	2	12 43.0	52.71	5	2	H.	
17	12 14.9	37.387	20	2	12 43.6	58.29	5	2	H.	
18	13 14.1	37.592	20	3	13 30.0	63.48	5	3	H.	
27	12 33.9	+ 28.718	24	3	12 50.8	+ 35.17	5	3	H.	
Sept. 22	11 0.1	− 35.102	20	2	. . .	. .	.	.	.	
23	10 7.6	36.096	18	3	10 27.7	− 36.82	5	3	H.	
25	10 34.7	37.522	20	3	10 52.8	46.61	4	3	H.	
26	10 24.4	37.854	20	2	10 41.9	50.95	5	2	H.	
29	8 53.2	37.406	20	2	9 21.0	61.40	5	2	H.	
Oct. 1	9 24.5	35.969	19	3	9 44.7	66.45	5	3	H.	
6	8 47.8	28.395	20	2	9 4.7	70.84	5	2	H.	
9	8 14.2	− 21.524	18	2	8 29.9	− 68.02	3	2	H.	
31	6 34.2	+ 33.693	22	2	6 52.7	+ 33.04	5	2	H.	
Nov. 6	6 59.2	35.890	20	2	7 18.5	46.04	5	2	H.	
7	6 26.6	35.412	20	2	7 46.1	58.40	5	2	H.	
12	7 0.6	29.978	22	2	7 22.3	65.89	5	2	H.	
13	6 23.1	28.385	20	2	6 41.9	66.15	5	2	H.	
16	6 31.8	22.461	24	2	7 0.5	65.28	3	2	H.	
17	6 22.3	20.193	20	3	6 48.5	63.94	5	3	H.	
19	6 58.2	15.354	20	2	7 23.7	60.95	5	2	H.	
20	6 23.0	+ 12.881	18	2	6 47.2	+ 57.80	5	2	H.	
Dec. 7	7 18.6	− 27.743	20	3	7 38.1	− 13.05	5	3	H.	
9	6 39.8	30.415	20	3	6 57.1	21.88	5	3	H.	
10	5 53.5	31.428	20	2	6 17.6	26.29	5	2	H.	
12	6 12.2	33.066	20	3	6 29.7	35.01	5	3	H.	
13	6 1.3	33.520	22	2	6 21.8	38.98	5	2	H.	
14	6 18.8	33.842	20	3	6 35.8	42.97	5	3	H.	
15	6 13.1	33.953	22	3	6 29.4	45.89	5	3	H.	
19	6 19.5	− 32.274	20	3	6 36.1	− 57.34	5	3	H.	

RESULTS OF OBSERVATIONS OF SATURN'S RING.

DATE.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Eye-piece.	Observer.	REMARKS.
1877.	h. m.	°					
June 18	15 8	94.82	4	2	3 A	H.	
19	15 20	94.80	4	2	3 A	H.	
22	14 50	95.18	4	2	3 A	H.	
23	14 57	94.76	4	2	3 A	H.	
25	14 46	94.80	4	2	3 A	H.	
July 10	14 50	95.20	5	1	400	Hn.	
11	14.6	94.68	4	1	5 A	Hn.	
11	14.7	94.58	4	1	400	Hn.	
13	14	95.03	5	2	400	Hn.	
Aug. 3	12 13	95.3	4	2	400	Hn.	
10	13 38	94.75	4	2	3 A	H.	
11	11 36	94.73	4	3	3 A	H.	
15	12 35	95.01	4	3	3 A	H.	
16	12 54	94.98	4	3	3 A	H.	
17	13 8	94.93	4	3	3 A	H.	
18	12 12	94.98	4	3	3 A	H.	
27	13 34	94.93	4	3	3 A	H.	
28	13 13	94.78	4	3	3 A	H.	
Sept. 23	10 44	95.13	4	3	3 A	H.	
29	9 40	95.08	4	2	3 A	H.	
1877.	h. m.	°					
Oct. 1	10 9	95.18	4	3	3 A	H.	
2	10 28	95.00	4	3	3 A	H.	
5	7 17	95.27	4	2	400	Hn.	
9	9 24	95.75	4	4	400	Hn.	
13	10 47	95.77	4	2	400	Hn.	
13	9 19	95.18	4	2	3 A	H.	
14	8 25	95.36	4	3	3 A	H.	
14	9 59	95.56	4	4	400	Hn.	
15	11 12	95.68	4	3	400	Hn.	
16	10 39	95.71	4	1	400	Hn.	
17	7 20	95.09	4	3	3 A	H.	
18	6 56	95.26	4	3	3 A	H.	
18	9 49	95.66	4	3	400	Hn.	
23	7 5	95.21	4	2	3 A	H.	
24	7 35	95.29	4	4	3 A	H.	
Dec. 2	6 24	95.10	4	3	3 A	H.	
7	6 48	95.40	4	3	3 A	H.	
8	6 9	95.15	4	2	3 A	H.	
9	6 18	95.27	4	3	3 A	H.	
15	7 2	94.80	4	3	3 A	H.	
19	6 52	95.20	4	3	3 A	H.	
31	6 23	95.55	4	2	3 A	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF URANUS.

DATE.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	REMARKS.
ARIEL.										
1877.	h. m.	°			h. m.	"				
April 5	9 7	199.3	1	1	. .	. .	.	.	Hn.	
UMBRIEL.										
Mar. 30	9 15	188*	.	.	. .	. .	.	.	Hn.	* Estimated.
April 5	9 15	18.3	4	3	. .	. .	.	.	Hn.	Foggy.
TITANIA.										
Mar. 10	10 19	327.9	5	2	10 46	19.11	2	2	Hn.	
15	10 34	94.9	4	2	. .	. .	.	.	Hn.	
29	8 53	219.0	4	1	9 40	24.68	1	1	Hn.	Single distance.
30	9 12	193.1	4	1	9 30	33.81	2	1	Hn.	Single distance.
April 5	10 15	346.1	1	4	. .	. .	.	.	Hn.	
OBERON.										
Mar. 10	11 33	9.2	4	2	11 0	46.18	2	2	Hn.	
15	10 0	212.1	4	2	10 19	35.69	3	2	Hn.	
29	9 6	204.3	4	1	9 27	40.81	2	1	Hn.	
30	9 28	190*	.	.	9 28	46.21	2	1	Hn.	* Estimated.
April 5	9 29	20.1	4	4	10 1	42.41	3	4	Hn.	

RESULTS OF OBSERVATIONS OF THE SATELLITE OF NEPTUNE.

E.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	REMARKS.
7.	h. m.	°			h. m.	"				
26	6 17	35.3	5	3	6 27	16.36	5	3	H.	
28	6 13	235.7	5	2	6 24	11.38	5	2	H.	Satellite extremely faint.
29	6 14	213.5	5	2	6 28	15.55	5	2	H.	Satellite extremely faint.
1	6 16	32.6	5	3	6 30	15.91	5	3	H.	
3	6 50	229.0	5	2	7 1	12.83	5	2	H.	Satellite very faint.
6	6 23	50.2	5	3	6 32	13.75	5	3	H.	Satellite faint.
6	11 41	19.3	4	1	11 53	11.90	2	1	Hn.	
18	10 18	12.9	4	1	10 31	10.53	2	1	Hn.	
31	9 22	240.8	4	2	9 34	12.33	3	2	Hn.	
4	10 50	32.9	4	2	11 4	16.50	2	2	Hn.	
6	10 37	234.4	4	2	10 52	14.22	2	2	Hn.	
7	10 28	213.8	1	3	10 36	15.84	2	3	Hn.	
7					10 48	15.97	1½		Hn.	Through fog.
12	10 25	231.1	4	3	10 44	15.25	4	3	Hn.	
13	10 7	208.9	4	3	10 25	15.10	3	3	Hn.	

OBSERVATIONS

MADE WITH THE

9.6-INCH EQUATORIAL.

1877.

THE 9.6-INCH EQUATORIAL.

This instrument was under the direction of Professor J. R. **Eastman**, U. S. N., assisted by the other observers on the Transit Circle, and was employed during 1877 in the observations of comets, the phenomena of Jupiter's satellites, occultations by the moon, and in the determination of the approximate corrections to the ephemerides of many of the minor planets.

The observations of the phenomena of Jupiter's satellites and the occultations by the moon were generally recorded on the Transit Circle chronograph, and are therefore given in the uncorrected time of the **Kessels** clock. The correction to the **Kessels** clock has been applied and the true Washington Mean Time computed for the final result.

The ephemerides of many of the minor planets were so much in error that it became necessary to determine the approximate corrections before these objects could be observed on the Transit Circle, and, without proper charts, this entailed a large expenditure of time and labor, which can only be appreciated by those who have been engaged in similar work.

In the compilation of the observations during the year, beginning on page 237, the work is recorded according to date, together with the observer's notes made at the time.

OBSERVATIONS

WITH

THE 9.6-INCH EQUATORIAL.

Date.	Observer.	Observations.
1877.		
Jan. 26	E.	Searched for Gallia (148), and found it at $8^h\ 30^m$, mean time. Approximate correction to ephemeris, + 34^s + 1′.8.
Feb. 1	E.	Searched for Austria (136), and found it at $8^h\ 30^m$, mean time. Approximate correction to ephemeris, + 14^s + 0′.6.
9	P.	Found Borelly's comet, and compared it with a star of 10.5 magnitude. Approximate place of star from Equatorial, $17^h\ 16^m\ 22^s + 2^\circ\ 39'.7$. Another star, 10.8 magnitude, follows, $5^s.5 - 2'.3$. From 27 transits and 4 bisections of star and comet it was found that at $14^h\ 41^m\ 0^s$, sidereal time— The α of comet = α of star + $20^s.34$, The δ of comet = δ of star + 3′ 36″.8. This and the following comet observations are uncorrected for refraction.
12	P.	Compared Borelly's comet with Weisse (2) XVII 817. From 29 transits and 7 bisections of star and comet it was found that at $14^h\ 37^m\ 7^s$, sidereal time— The α of comet = α of star + $4^s.39$, The δ of comet = δ of star − 4′ 17″.4.
15	P.	Found Hecate very near ephemeris' place.
17	P.	Compared Borelly's comet with Lalande 33849. From 18 transits and 5 bisections of star and comet it was found that at $13^h\ 58^m\ 36^s$, sidereal time— The α of comet = α of star + $56^s.88$, The δ of comet = δ of star + 4′ 25″.2.
19	P.	Found Lachesis. Approximate correction to ephemeris, + 4^s − 0′.4.
19	P.	From a single equatorial observation the approximate place of Borelly's comet at $12^h\ 10^m$, sidereal time, was $19^h\ 2^m\ 20^s + 65^\circ\ 14'$.
April 11	P.	Found Ate (111). Correction to ephemeris, − 69^s + 8′.6.
11	P.	Compared comet (*b*), 1877, with Durch. + 22°, 4614. From 33 transits and 5 bisections of star and comet it was found that at $17^h\ 28^m\ 5^s$, sidereal time— The α of comet = α of star − $0^s.97$, The δ of comet = δ of star − 6′ 15″.0. The comet has a small bright nucleus, easily observed.
21	P.	Observed immersion of Uranus at $14^h\ 32^m\ 34^s.5 = 12^h\ 31^m\ 1^s.7$, mean time. Atmosphere unsteady.
22	E.	Observed immersion of 45 Leonis at $11^h\ 8^m\ 38^s.5 = 9^h\ 3^m\ 43^s.3$, mean time. Observed emersion of 45 Leonis at $12^h\ 15^m\ 32^s.4 = 10^h\ 10^m\ 26^s.2$, mean time.
23	P.	Found Dione, (106). Correction to ephemeris, − 13^s + 1′.8.
23	P.	Found Ianthe, (98). Correction to ephemeris, + 48^s − 9′.5.
May 12	P.	Compared comet (*c*), 1877, with Durch. 54°, 1055. From 18 transits and 5 bisections of the star and comet it was found that at $13^h\ 20^m\ 52^s$, sidereal time— The α of comet = α of star − $17^s.68$, The δ of comet = δ of star + 48″.8. Comet very faint and difficult to observe.
July 6	P.	Observed the occultations of the following stars of the Pleiades. The numbers are BESSELS' numbers on the Coast Survey Chart of the Pleiades.

Number.	Phase.	Sid. time.		Mean time.
		h. m. s.		h. m. s.
1.	Immersion,	22 0 37.4	=	14 59 1.9
4.	Immersion,	13 34.1	=	15 11 56.5
8.	Immersion,	22 20.5	=	20 41.5

<table>
<tr><th>Date.</th><th>Observer.</th><th>Observations.</th></tr>
<tr><td>1877.
July 6</td><td>P.</td><td>Stars of the Pleiades—Continued.
<table>
<tr><th>Number.</th><th>Phase.</th><th>Sid. time.
h. m. s.</th><th></th><th>Mean time.
h. m. s.</th></tr>
<tr><td>11.</td><td>Immersion,</td><td>22 27 21.1</td><td>=</td><td>15 25 41.2</td></tr>
<tr><td>13.</td><td>Immersion,</td><td>33 0.7</td><td>=</td><td>31 19.9</td></tr>
<tr><td>14.</td><td>Immersion,</td><td>34 56.4</td><td>=</td><td>33 15.3</td></tr>
<tr><td>1.</td><td>Emersion,</td><td>51 42.5</td><td>=</td><td>49 58.6</td></tr>
<tr><td>20.</td><td>Immersion,</td><td>22 58 23.6</td><td>=</td><td>15 56 38.7</td></tr>
<tr><td>10.</td><td>Emersion,</td><td>23 6 2.4</td><td>=</td><td>16 4 16.2</td></tr>
<tr><td>8.</td><td>Emersion,</td><td>11 20.9</td><td>=</td><td>9 33.9</td></tr>
<tr><td>4.</td><td>Emersion,</td><td>12 10.6</td><td>=</td><td>10 23.4</td></tr>
<tr><td>11.</td><td>Emersion,</td><td>18 22.3</td><td>=</td><td>16 34.1</td></tr>
<tr><td>6.</td><td>Emersion,</td><td>20 46.8</td><td>=</td><td>18 58.2</td></tr>
<tr><td>14.</td><td>Emersion,</td><td>23 35 28.8</td><td>=</td><td>16 33 37.8</td></tr>
</table></td></tr>
<tr><td>Aug. 21</td><td>E.</td><td>At midnight, looked for the outer satellite of Mars, and found it before it had reached its greatest elongation following. At 14^{h}, looked again, and found it more readily. It was very faint, and visible only at intervals, and then only by putting Mars out of the field. Estimated the magnitude to be 13.5. It was also seen by Prof. A. HALL with this instrument.</td></tr>
<tr><td>Sept. 25</td><td>P.</td><td>Observed immersion of μ Arietis at $20^{h}\ 48^{m}\ 34^{s}.0 = 8^{h}\ 28^{m}\ 41^{s}.6$, mean time.</td></tr>
<tr><td>Oct. 1</td><td>P.</td><td>At $12^{h}\ 30^{m}$, mean time, saw the outer satellite of Mars with three different eye-pieces, magnifying 202, 296, and 433 diameters. Could see it most plainly with the 433 power. No eye-pieces of higher power were in condition to use. With 202 the satellite was very difficult to see, and with all of them it was necessary to put the planet out of the field, except with 433. With that could glimpse the satellite two or three times, with Mars in the field. At $12^{h}\ 30^{m}$, the position of the satellite was, by estimation, $p = 260^{\circ}$, and about three diameters of the planet from the preceding limb.</td></tr>
<tr><td>4</td><td>P.</td><td>Compared comet (*e*) Tempel, 1877, with an anonymous star, 8.5 magnitude, whose approximate position from the Equatorial was $23^{h}\ 43^{m}\ 22^{s} - 13^{\circ}\ 1'.3$. From 31 transits and 5 bisections of star and comet it was found that at $1^{h}\ 36^{m}\ 31^{s}$, sidereal time—
The α of comet = α of star $- 68^{s}.44$,
The δ of comet = δ of star $+ 5'\ 48''.6$.</td></tr>
<tr><td>4</td><td>P.</td><td>Compared comet (*d*) Coggia, 1877, with an anonymous star, 9.0 magnitude, whose approximate place from the Equatorial was $8^{h}\ 10^{m}\ 50^{s} + 42^{c}\ 7'.0$. From 30 transits and 5 bisections of the star and comet it was found that at $4^{h}\ 53^{m}\ 49^{s}$, sidereal time—
The α of comet = α of star $- 7^{s}.78$,
The δ of comet = δ of star $- 1'\ 38''.3$.</td></tr>
<tr><td>11</td><td>P.</td><td>Compared comet (*d*) Coggia, 1877, with Weisse (2) VII, 1566. From 26 transits and 6 bisections of the star and comet it was found that at $4^{h}\ 28^{m}\ 9^{s}$, sidereal time—
The α of comet = α of star $- 17^{s}.37$,
The δ of comet = δ of star $+ 4'\ 39''.8$.</td></tr>
<tr><td>Dec. 8</td><td>E.</td><td>Observed occultation of Venus. First contact of limbs of Moon and Venus at $0^{h}\ 31^{m}\ 51^{s}.2 = 7^{h}\ 20^{m}\ 25^{s}.0$, mean time. Definition of Venus very bad. Dark limb of Moon very faint.</td></tr>
</table>

CORRECTIONS

TO THE

NORTH-POLAR DISTANCES

OF THE

STARS OF THE AMERICAN EPHEMERIS,

GIVEN BY

OBSERVATIONS WITH THE TRANSIT CIRCLE.

1877.

CORRECTIONS

TO THE

NORTH-POLAR DISTANCES OF THE STARS OF THE AMERICAN EPHEMERIS,

GIVEN BY

OBSERVATIONS WITH THE TRANSIT CIRCLE, 1877.

NOTE.—The right ascension and north-polar distance for each star are taken directly from the American Ephemeris for 1877.0.

α Andromedæ.

	h. m. s.
Right Ascension,	0 2 1.911
North-Polar Dist.,	61° 35′ 18″.51

1877.				″
Jan.	29	F.	+	2.6
Feb.	6	F.	+	2.1
	8	P.	+	1.9
	9	E.	+	1.6
	13	E.	+	1.1
	15	S.	+	3.4
	17	E.	+	1.4
	21	E.	+	2.2
Mar.	6	S.	+	2.5
April	6	F.	+	0.6
	10	F.	+	3.3
May	3	E.	+	2.0
	6	S.	+	2.4
July	1	S.	+	2.0
	30	P.	+	1.6
Aug.	18	F.	+	2.5
	21	E.	+	1.1
	27	S.	+	1.7
	28	E.	+	1.7
Sept.	1	F.	+	2.1
	3	F.	+	2.2
	21	F.	−	0.6
	26	P.	+	1.1
Oct.	2	P.	+	0.7
	11	E.	−	0.8
	12	F.	+	1.2
	13	S.		0.0
	14	P.	+	0.4
	15	E.	+	1.7
	22	F.	+	0.6
Nov.	2	S.	+	1.4
	3	F.	+	0.5
	13	F.	+	0.6
	17	F.	+	1.9
	19	P.	+	0.5
Dec.	6	E.	+	1.7
	8	F.	+	1.7
	11	F.	+	1.5
Mean			+	1.48
Div., Flex., etc.			+	0.11

α Andromedæ (Ref.).

1877.				″
Feb.	8	P.		0.0
Oct.	2	P.	+	0.9
	14	P.	+	1.1
Mean			+	0.67
Div., Flex., etc.			+	0.28

γ Pegasi.

	h. m. s.
Right Ascension,	0 6 54.198
North-Polar Dist.,	75° 30′ 0″.36

γ Pegasi—Continued.

1877.				″
Jan.	29	F.	+	4.0
Feb.	6	F.	+	3.5
	8	P.	+	3.6
	9	E.	+	3.8
	13	E.	+	2.2
	15	S.	+	4.0
	17	E.	+	2.8
	21	E.	+	2.8
Mar.	6	S.	+	1.4
April	6	F.	+	2.7
	10	F.	+	2.2
	22	F.	+	1.4
May	3	E.	+	1.8
	6	S.	+	3.2
July	1	S.	+	1.9
	30	P.	+	2.
Aug.	18	F.	+	1.2
	21	E.	+	2.2
	27	S.	+	3.3
	28	E.	+	3.0
Sept.	1	F.	+	2.1
	3	F.	+	1.7
	21	F.	−	0.2
	26	P.	+	1.4
Oct.	1	F.	+	1.8
	2	P.	+	2.0
	12	F.	−	0.2
	13	S.	+	0.9
	14	P.	+	1.1
	15	E.	+	1.5
	22	F.	+	0.7
	24	P.	+	2.0
Nov.	2	S.	+	1.8
	3	F.	+	0.2
	7	F.	+	1.7
	13	F.	+	0.9
	17	F.	+	2.9
Dec.	3	P.	+	3.1
	8	F.	+	1.6
	10	E.	+	1.3
	11	F.	+	2.1
	14	E.	+	0.9
Mean			+	2.03
Div., Flex., etc.			−	0.16

γ Pegasi (Ref.).

1877.				″
Oct.	24	P.	+	0.4
Dec.	10	E.	+	1.0
Mean			+	0.70
Div., Flex., etc.			+	0.35

α Cassiopeæ.

	h. m. s.
Right Ascension,	0 33 32.239
North-Polar Dist.,	34° 8′ 15″.35

1877.				″
May	3	E.	+	1.0
	10	P.	+	1.4

α Cassiopeæ—Continued.

1877.				″
July	30	P.	+	1.5
Oct.	24	P.	+	1.6
Mean			+	1.38
Div., Flex., etc.			−	0.97

Cassiopeæ (Ref.).

1877.				″
May	3	E.	−	0.4
	10	P.	−	0.7
July	30	P.	−	0.3
Oct.	24	P.	−	1.5
Mean			−	0.72
Div., Flex., etc.			+	1.39

β Ceti.

	h. m. s.
Right Ascension,	0 37 24.834
North-Polar Dist.,	108° 39′ 42″.91

1877.				″
Feb.	8	P.	+	2.3
	9	E.	+	2.7
	10	F.	+	0.7
	13	E.	+	2.5
	15	S.	+	3.2
	17	E.	+	0.7
	21	E.	+	1.3
Mar.	6	S.	+	1.2
Apr.	23	S.		0.0
May	3	E.	+	0.4
	6	P.	−	1.2
	10	P.	+	0.4
July	1	S.	+	1.6
	29	S.	+	0.8
	30	P.	+	1.8
Sept.	26	P.		0.0
Oct.	2	P.	+	1.0
	13	S.	−	0.8
	14	P.	−	0.4
	15	E.	+	0.4
	22	F.	−	0.4
Nov.	2	S.	+	0.9
	7	F.	+	1.0
	19	P.	+	0.2
Dec.	3	P.	+	1.8
	11	F.	+	2.5
	15	F.	+	1.3
Mean			+	0.96
Div., Flex., etc.			+	0.10

21 Cassiopeæ, S. P.

	h. m. s.
Right Ascension,	0 37 33.198
North-Polar Dist.,	344° 18′ 53″.22

21 Cassiopeæ, S. P.—Continued.

1877.				″
Feb.	20	P.	+	2.1
April	25	P.	+	3.6
May	23	P.	+	3.7
Mean			+	3.13
Div., Flex., etc.			−	1.24

ε Piscium.

	h. m. s.
Right Ascension,	0 56 33.641
North-Polar Dist.,	82° 46′ 20″.51

1877.				″
Feb.	8	P.	+	2.2
	10	F.	+	1.9
July	29	S.	+	1.0
	30	P.	+	1.1
Oct.	2	P.	+	0.2
	6	F.	+	0.7
	13	S.		0.0
	14	P.	+	0.1
	22	F.	+	0.6
	24	P.	−	0.3
Nov.	17	F.	+	0.6
	19	P.	+	0.2
Dec.	15	F.	+	1.5
Mean			+	0.75
Div., Flex., etc.			−	0.02

Polaris.

	h. m. s.
Right Ascension,	1 13 42.205
North-Polar Dist.,	1° 20′ 48″.12

1877.				″
Feb.	8	P.	+	2.1
	9	E.	−	0.4
	10	F.	+	0.5
	13	E.	+	2.2
	15	S.	+	0.7
	17	E.	+	0.4
	21	E.		0.0
	28	P.	+	2.4
Mar.	1	E.	+	0.7
	3	S.	+	1.1
	6	S.	+	1.8
	15	P.	+	1.5
	20	F.	+	1.4
	30	F.	+	1.4
April	3	F.	+	2.8
	5	E.	+	2.3
	7	F.	+	2.1
	10	F.	+	1.5
	11	S.	+	
	22	F.	+	

Polaris—Continued.

1877.				″
April	23	S.	−	2.2
May	3	E.	+	0.5
	6	S.	+	1.0
	6	P.	+	0.2
	9	S.	+	0.9
	16	F.	+	1.4
	17	S.	−	1.1
	21	S.	+	0.7
	25	S.	−	0.6
July	1	S.	+	1.9
	29	S.	+	0.4
	30	P.	+	1.3
Sept.	26	P.	+	1.0
Oct.	2	P.	+	1.2
	6	F.	+	0.6
	13	S.	−	0.8
	14	P.	+	1.1
	15	E.	−	0.6
	18	P.	+	1.1
	22	F.	+	0.1
	23	E.	+	0.5
	24	P.	+	0.4
	31	E.	+	2.0
Nov.	2	S.	+	0.9
	3	F.	−	1.5
	7	F.	+	1.4
	12	E.	−	1.3
	13	F.	+	1.2
	16	E.	+	3.2
	17	F.	+	1.5
	19	P.	+	0.8
	20	E.	+	1.5
Dec.	3	P.	+	0.9
	8	F.	+	0.6
	10	E.	−	1.2
	11	F.	+	0.1
	14	E.	+	1.9
	15	F.	+	0.5
Mean			+	0.83
Div., Flex., etc.			−	1.01

Polaris, S. P.

	h. m. s.
Right Ascension,	1 13 42.205
North-Polar Dist.,	358° 39′ 11″.88

1877.				″
Feb.	20	P.	+	0.7
Mar.	7	S.	+	0.4
	15	P.	+	1.5
	23	S.	+	0.3
	24	P.	+	1.2
	29	E.	+	0.8
	30	F.	+	0.7
April	5	P.	+	1.6
	7	F.	+	0.5
	11	F.	+	0.7
	14	E.	+	2.0
	22	E.	+	1.6
	23	F.	+	0.4
	25	P.	+	1.8
May	1	F.	−	0.6
	12	E.	+	2.1
	14	S.	+	1.6
	15	P.	+	1.6
	17	F.	+	2.5
	18	S.	+	2.5
	22	S.	+	1.8
	23	P.	+	2.5
	28	E.	+	2.2
	31	P.	+	1.1
June	1	E.	+	2.1
	11	S.	+	3.2
	19	S.	+	1.1
	23	S.	+	2.2
July	15	E.	−	1.8
Sept.	10	F.	−	3.0
Oct.	5	S.	−	0.5
	12	S.	+	4.4

Polaris, S. P.—Continued.

1877.				″
Oct.	22	E.		0.0
Nov.	2	F.	−	1.4
	6	F.	−	2.2
	11	E.	−	1.1
	12	F.	−	0.3
	15	E.	−	1.4
	16	F.	−	3.8
	19	E.	−	0.7
Mean			+	0.71
Div., Flex., etc.			−	1.01

θ¹ Ceti.

	h. m. s.
Right Ascension,	1 17 52.529
North-Polar Dist ,	98° 49′ 5″.53

1877.				″
May	17	S.		0.0
July	29	S.	+	3.8
	30	P.	+	2.4
Oct.	2	P.	+	1.2
	13	S.	+	0.6
	18	P.	+	2.0
	22	F.	+	0.6
	24	P.	+	2.0
Nov.	3	F.	+	2.3
	8	F.	+	2.5
Dec.	15	F.	+	2.0
Mean			+	1.76
Div., Flex., etc.			+	0.05

38 Cassiopeæ, S. P.

	h. m. s.
Right Ascension,	1 22 6
North-Polar Dist.,	339° 37′ 50″.30

1877.				″
Feb.	20	P.		0.0
Mar.	15	P.	+	2.0
Mean			+	0.50
Div., Flex., etc.			−	1.14

η Piscium.

	h. m. s.
Right Ascension,	1 24 54
North-Polar Dist.,	75° 17′ 18″.77

1877.				″
Feb.	21	E.	+	3.9
	28	P.	+	3.7
Mar.	15	P.	+	3.3
April	22	F.	+	4.5
May	25	S.	+	2.8
July	1	S.	+	1.9
	29	S.	+	1.7
Oct.	18	P.	+	2.9
	22	F.	+	1.4
	24	P.	+	2.0
Nov.	3	F.	+	0.3
	7	F.	+	1.3
	19	P.	+	2.0
	20	E.	+	0.8
Dec.	3	P.	+	2.0
	11	F.	+	1.9
	15	F.	+	2.4
Mean			+	2.28
Div., Flex., etc.			−	0.17

η Piscium (Ref.).

1877.				″
Nov.	19	P.	+	1.8
	20	E.	+	1.1
Mean			+	1.45
Div., Flex., etc.			+	0.34

o Piscium.

	h. m. s.
Right Ascension,	1 38 54
North-Polar Dist.,	81° 27′ 43″.11

1877.				″
May	21	S.	+	1.1
	25	S.	+	1.1
Oct.	18	P.	+	1.3
	22	F.	+	0.2
	24	P.	+	0.6
	31	E.		0.0
Nov.	3	F.	−	0.2
Dec.	10	E.	−	0.3
Mean			+	0.48
Div., Flex., etc.			−	0.13

o Piscium (Ref.).

1877.				″
Oct.	22	F.	+	0.9
Div., Flex., etc.			+	0.48

β Arietis.

	h. m. s.
Right Ascension,	1 47 51
North-Polar Dist.,	69° 47′ 37″.42

1877.				″
Feb.	21	E.	+	4.7
Mar.	15	P.	+	3.6
	20	F.	+	3.5
	30	F.	+	2.2
May	10	P.	+	1.4
	14	P.	+	1.3
	17	S.	+	1.4
	21	S.	+	2.3
	25	S.	+	1.0
	27	E.	−	0.4
	31	E.	+	0.9
July	29	S.	+	2.4
Oct.	18	P.	+	2.8
	24	P.	+	1.3
Nov.	3	F.	−	0.1
	7	F.	+	2.7
Dec.	8	F.	+	1.8
	11	F.	+	1.3
Mean			+	1.89
Div., Flex., etc.			−	0.15

β Arietis (Ref.).

1877.				″
Nov.	3	F.	+	1.8
Div., Flex., etc.			+	0.36

50 Cassiopeæ.

	h. m. s.
Right Ascension,	1 52 58
North-Polar Dist.,	18° 10′ 31″.88

1877.				″
May	17	S.	+	1.2
	21	S.	+	0.5
	25	S.	+	2.4
Oct.	24	P.	−	0.1
Nov.	19	P.	−	0.2
Dec.	3	P.	+	0.1
Mean			+	0.65
Div., Flex., etc.			−	1.19

50 Cassiopeæ (Ref.).

1877.				″
Nov.	19	P.	−	2.1
Dec.	3	P.	−	2.3
Mean			−	2.20
Div., Flex., etc.			+	1.36

50 Cassiopeæ, S. P.

	h. m. s.
Right Ascension,	1 52 58
North-Polar Dist.,	341° 49′ 28″.12

1877.				″
Mar.	15	P.	+	2.5
April	25	P.	+	2.2
May	15	P.	+	3.4
	18	S.	+	0.9
	23	P.	+	2.2
Mean			+	2.24
Div., Flex., etc.			−	1.20

α Arietis.

	h. m. s.
Right Ascension,	2 0 14
North-Polar Dist.,	67° 7′ 11″.56

1877.				″
Feb.	21	E.	+	1.6
Mar.	3	S.	+	3.7
	15	P.	+	2.8
	20	F.	+	3.8
	30	F.	+	3.2
May	10	P.	+	2.5
	17	S.	+	0.5
	21	S.	+	1.6
	22	P.	+	1.6
	27	E.	+	1.9
	31	E.	+	1.3
Oct.	22	F.	+	1.5
	24	P.	+	0.8
	31	E.	+	1.7
Nov.	2	S.	+	1.5
	3	F.	+	1.0
	7	F.	−	0.4
	17	F.	+	2.8
Dec.	10	E.	+	1.8
	11	F.	+	3.5
Mean			+	1.94
Div., Flex., etc.			−	0.07

α Arietis (Ref.).

1877.				″
Feb.	21	E.	+	1.2
Oct.	22	F.	+	0.2
Mean			+	0.70
Div., Flex., etc.			+	0.37

ξ¹ Ceti.

	h. m. s.
Right Ascension,	2 6 29
North-Polar Dist.,	81° 43′ 52″.12

1877.				″
May	25	S.	+	1.8
Oct.	31	E.	+	0.9
Nov.	3	F.		0.0
	16	E.	+	0.3
Dec.	3	P.	+	0.1
	11	F.	+	1.6
Mean			+	0.78
Div., Flex., etc.			−	0.11

ξ^1 CETI (Ref.).

1877.				″
Dec.	3	P.	−	0.4
Div., Flex., etc.			+	0.50

ι CASSIOPEÆ.

	h. m. s.
Right Ascension,	2 18 57
North-Polar Dist.,	23° 9′ 8″.88

1877.				″
May	17	S.	−	1.3
	25	S.	−	0.6
Oct.	31	E.	+	1.7
Dec.	18	E.	−	0.3
Mean			−	0.12
Div., Flex., etc.			−	1.01

ι CASSIOPEÆ (Ref.).

1877.				″
Oct.	31	E.	−	2.6
Div., Flex., etc.			+	1.61

ι CASSIOPEÆ, S. P.

	h. m. s.
Right Ascension,	2 18 57
North-Polar Dist.,	336° 50′ 51″.12

1877.				″
Mar.	15	P.	+	1.6
May	18	S.	+	2.7
June	11	S.	+	3.9
Mean			+	2.73
Div., Flex., etc.			−	1.02

γ CETI.

	h. m. s.
Right Ascension,	2 36 56
North-Polar Dist.,	87° 17′ 0″.52

1877.				″
Aug.	3	P.	−	0.1
Oct.	18	P.	−	0.5
	23	E.	+	0.8
	24	P.	−	0.2
Nov.	12	E.	−	0.5
	16	E.	+	0.9
Dec.	8	F.	−	0.3
	18	E.	+	1.0
Mean			+	0.14
Div., Flex., etc.			+	0.14

γ CETI (Ref.).

1877.				″
Oct.	18	P.	+	0.2
Div., Flex., etc.			+	0.51

α CETI.

	h. m. s.
Right Ascension,	2 55 51
North-Polar Dist.,	86° 23′ 38″.37

1877.				″
Jan.	25	F.	+	1.6
Mar.	20	F.	+	1.2
	30	F.	+	1.8
May	25	S.		0.0
	27	E.	+	2.2
June	7	E.	−	1.4
	18	S.	+	1.7
Aug.	3	P.	+	0.3
Oct.	22	F.	−	0.8
	23	E.	−	0.4
Nov.	12	E.	−	0.7
Dec.	18	E.	+	0.8
Mean			+	0.52
Div., Flex., etc.			+	0.12

48 CEPHEI.

	h. m. s.
Right Ascension,	3 4 47
North-Polar Dist.,	12° 43′ 14″.14

1877.				″
Jan.	25	F.	+	1.8
Oct.	23	E.	−	0.3
Nov.	19	P.	−	0.9
Dec.	3	P.	−	0.9
Mean			−	0.08
Div., Flex., etc.			−	1.10

48 CEPHEI, S. P.

	h. m. s.
Right Ascension,	3 4 47
North-Polar Dist.,	347° 16′ 45″.86

1877.				″
Mar.	15	P.	+	0.7
May	23	P.	+	3.3
July	7	E.	+	3.5
Mean			+	2.50
Div., Flex., etc.			−	1.26

ζ ARIETIS.

	h. m. s.
Right Ascension,	3 7 50
North-Polar Dist.,	69° 24′ 44″.56

1877.				″
Oct.	23	E.	+	1.1
Nov.	7	F.	−	1.4
	12	E.	+	0.4
	16	E.	+	1.0
Dec.	8	F.	+	1.8
	11	F.	+	1.7
	18	E.	+	0.9
Mean			+	0.79
Div., Flex., etc.			−	0.14

ζ ARIETIS (Ref.).

1877.				″
Dec.	11	F.	+	2.2
Div., Flex., etc.			+	0.37

α PERSEI.

	h. m. s.
Right Ascension,	3 15 33
North-Polar Dist.,	40° 24′ 42″.76

1877.				″
May	7	P.	+	1.2
	14	P.	+	1.8
June	7	E.	−	1.0
	18	S.	+	0.4
	22	S.	+	0.7
Oct.	24	P.	−	0.5
Nov.	3	F.	+	2.3
Mean			+	0.70
Div., Flex., etc.			−	0.82

α PERSEI (Ref.).

1877.				″
May	7	P.	−	2.2
	14	P.	−	0.5
June	22	S.	+	1.1
Oct.	24	P.	−	0.6
Nov.	3	F.	−	2.7
Mean			−	0.98
Div., Flex., etc.			+	1.10

δ PERSEI.

	h. m. s.
Right Ascension,	3 34 10
North-Polar Dist.,	42° 36′ 28″.25

1877.				″
April	11	F.	−	0.2
June	22	S.		0.0
Nov.	13	F.	−	0.2
Dec.	18	E.	−	0.3
Mean			−	0.18
Div., Flex., etc.			−	0.79

δ PERSEI (Ref.).

1877.				″
Nov.	13	F.	−	1.6
Dec.	18	E.	−	1.1
Mean			−	1.35
Div., Flex., etc.			+	1.10

η TAURI.

	h. m. s.
Right Ascension,	3 40 10
North-Polar Dist.,	66° 16′ 36″.11

1877.				″
Jan.	24	E.	+	0.2
	29	F.	+	2.1
April	11	F.	+	1.0
	12	S.	+	1.4
	24	S.	+	1.5
June	12	E.	−	0.5
Aug.	3	P.	+	1.0
Oct.	24	P.	−	0.1
Nov.	2	S.	+	1.5
	19	P.	+	0.1
	20	E.	−	0.6
Dec.	14	E.	+	0.2
	18	E.	+	1.1
Mean			+	0.68
Div., Flex., etc.			−	0.02

η TAURI (Ref.).

1877.				″
Oct.	24	P.	+	0.7
Nov.	2	S.	−	0.3
Dec.	18	E.		0.6
Mean			−	0.07
Div., Flex., etc.			+	0.35

ζ PERSEI.

	h. m. s.
Right Ascension,	3 46 24
North-Polar Dist.,	58° 29′ 0″.17

1877.				″
Jan.	24	E.	+	0.2
	29	F.	+	1.1
Mar.	20	F.	+	1.7
April	7	F.	+	1.1
	11	F.	+	1.8
	12	S.	+	1.4
June	12	E.	+	1.4
	18	S.	−	0.6
Aug.	3	P.	+	0.5
Oct.	24	P.	−	0.4
Nov.	19	P.	−	0.8
	20	E.	+	0.1
Dec.	11	F.	+	0.6
	14	E.	−	0.8
Mean			+	0.52
Div., Flex., etc.			+	0.08

γ^1 ERIDANI.

	h. m. s.
Right Ascension,	3 52 17
North-Polar Dist.,	103° 51′ 33″.62

1877.				″
Jan.	24	E.	+	3.0
	29	F.	+	0.3
Mar.	20	F.	+	2.7
April	11	F.	+	4.6
	12	S.	+	3.9
June	12	E.	+	1.9
	18	S.	+	2.8
	22	S.	+	1.7
Aug.	3	P.	+	1.3
Oct.	24	P.	+	0.6
Nov.	2	S.	+	2.2
	13	F.	+	3.3
	19	P.	+	1.7
	20	E.	+	1.4
Dec.	8	F.	+	3.3
	11	F.	+	2.5
	14	E.	+	1.0
	19	F.	+	0.6
Mean			+	2.16
Div., Flex., etc.			+	0.15

γ TAURI.

	h. m. s.
Right Ascension,	4 12 48
North-Polar Dist.,	74° 40′ 14″.80

1877.				″
Jan.	25	F.	+	2.8
	26	S.	+	3.1
Feb.	20	P.	+	3.7
Mar.	20	F.	+	3.0
April	7	F.	+	2.5
June	22	S.	+	1.8
Aug.	3	P.	+	2.0
Oct.	24	P.	+	0.9
Nov.	2	S.	+	2.2
	13	F.	+	0.4
	19	P.	+	0.7
Dec.	8	F.	+	1.0
	14	E.	+	0.4
	19	F.	+	2.1
Mean			+	1.90
Div., Flex., etc.			−	0.19

γ TAURI (Ref.).

1877.				″
Dec.	14	E.	+	0.7
Div., Flex., etc.			+	0.34

ϵ TAURI.

	h. m. s.
Right Ascension,	4 21 26
North-Polar Dist.,	71° 5′ 37″.59

1877.				″
Jan.	25	F.	+	3.7
Feb.	20	P.	+	3.4
Mar.	20	F.	+	3.1
April	7	F.	+	3.8
	24	S.	+	3.3
June	22	S.	+	3.7
Nov.	2	S.	+	1.5
Dec.	19	F.	+	
Mean				
Div., Flex., etc.				

α TAURI.

	h. m. s.
Right Ascension,	4 28 52
North-Polar Dist.,	73° 44′ 21″.84

1877.				″
Jan.	25	F.	+	2.1
	26	S.	+	3.1
Feb.	21	E.	+	3.0
Mar.	20	F.	+	1.8
April	7	F.	+	2.9
	11	F.	+	4.2
	23	F.	+	5.0
	24	S.	+	4.2
May	4	E.	+	2.9
June	19	P.	+	2.9
	22	S.	+	2.8
July	6	E.	+	2.7
	12	S.	+	3.1
Aug.	3	P.	+	1.4
Oct.	24	P.	+	1.0
Mean			+	2.87
Div., Flex., etc. . . .			−	0.20

α TAURI (Ref.).

1877.				″
May	4	E.	+	2.0
Div., Flex., etc. . . .			+	0.33

9 CAMELOPARDALIS.

	h. m. s.
Right Ascension,	4 41 50
North-Polar Dist.,	23° 52′ 9″.25

1877.				″
Feb.	20	P.	+	2.3
	21	E.	+	2.3
April	7	F.	+	1.4
June	22	S.	+	1.9
Oct.	24	P.	+	2.0
Mean			+	1.98
Div., Flex., etc. . . .			−	0.99

9 CAMELOPARDALIS, S. P.

	h. m. s.
Right Ascension,	4 41 50
North-Polar Dist.,	336° 7′ 50″.75

1877.				″
June	23	S.	+	1.5
	25	P.	+	0.5
Mean			+	1.00
Div., Flex., etc. . . .			−	0.97

ι AURIGÆ.

	h. m. s.
Right Ascension,	4 48 59
North-Polar Dist.,	57° 1′ 49″.69

1877.				″
Jan.	25	F.	+	4.1
	26	S.	+	3.1
Feb.	6	F.	+	3.6
	20	P.	+	1.9
April	7	F.	+	2.3
	11	F.	+	2.9
	23	F.	+	4.1
July	6	E.	+	1.9
	11	F.	+	0.2
Aug.	3	P.	+	1.2
Oct.	24	P.	+	1.4
Dec.	18	E.	+	0.9
Mean			+	2.30
Div., Flex., etc. . . .			+	0.14

11 ORIONIS.

	h. m. s.
Right Ascension,	4 57 33
North-Polar Dist.,	74° 46′ 7″.45

1877.				″
Jan.	25	F.	+	2.0
Feb.	6	F.	+	3.0
	21	E.	+	1.7
Mean			+	2.23
Div., Flex., etc, . . .			−	0.18

11 ORIONIS (Ref.).

1877.				″
Jan.	25	F.	−	0.8
Feb.	21	E.	+	0.8
Mean				0.00
Div., Flex., etc. . . .			+	0.34

α AURIGÆ.

	h. m. s.
Right Ascension,	5 7 36
North-Polar Dist..	44° 7′ 45″.99

1877.				″
Jan.	25	F.	+	0.6
	26	S.	+	1.7
	29	F.	+	0.5
Feb.	14	F.	+	2.2
	20	P.	+	2.9
May	4	E.	+	2.4
	17	F.	+	2.1
June	25	F.	+	1.5
July	11	F.	−	0.4
	12	S.	+	1.5
Mean			+	1.50
Div., Flex., etc. . . .			−	0.77

α AURIGÆ (Ref.).

1877.				″
Jan.	25	F.	−	2.2
	26	S.	−	1.5
Feb.	20	P.	−	0.6
May	4	E.	−	0.5
Mean			−	1.20
Div., Flex., etc. . . .			+	1.09

β ORIONIS.

	h. m. s.
Right Ascension,	5 8 38
North-Polar Dist.,	98° 20′ 42″.60

1877.				″
Jan.	30	S.	+	0.9
Feb.	7	S.	+	3.6
	8	P.	+	1.3
	9	E.	+	2.6
	10	F.	+	3.3
	15	S.	+	2.2
	21	E.	+	3.9
April	23	F.	+	2.7
May	15	P.	+	2.5
	17	F.	+	0.3
	18	S.	+	2.4
June	25	F.	+	2.5
July	6	E.	+	1.0
	11	F.	+	0.8
Dec.	8	F.	+	0.8
	11	F.	+	1.1
	19	F.	+	2.5
Mean			+	2.02
Div., Flex., etc. . . .			+	0.05

β TAURI.

	h. m. s.
Right Ascension,	5 18 31
North-Polar Dist.,	61° 29′ 54″.36

1877.				″
Jan.	26	S.	+	0.7
	30	S.	+	1.2
Feb.	7	S.	+	2.9
	8	P.	+	0.9
	9	E.	+	2.0
	10	F.	+	1.1
	14	F.	+	3.5
	15	S.	+	1.2
	20	P.	+	1.1
	21	E.	+	2.0
May	18	S.	+	1.8
June	25	F.	+	1.1
July	11	F.	−	0.7
	12	S.	+	1.9
Dec.	8	F.	−	0.1
Mean			+	1.37
Div., Flex., etc. . . .			+	0.11

β TAURI (Ref.).

1877.				″
Jan.	26	S.	−	0.5
Feb.	20	P.	+	0.6
Mean			+	0.05
Div., Flex., etc. . . .			+	0.27

GROOMBRIDGE 966, S. P.

	h. m. s.
Right Ascension,	5 23 18
North-Polar Dist.,	344° 57′ 28″.00

1877.				″
June	23	S.	+	3.4
July	26	P.	+	2.2
	30	P.	+	0.6
Mean			+	2.07
Div., Flex., etc. . . .			−	1.23

δ ORIONIS.

	h. m. s.
Right Ascension,	5 25 43
North-Polar Dist.,	90° 23′ 30″.68

1877.				″
Jan.	29	F.	+	0.4
	30	S.	+	1.6
Feb.	7	S.	+	3.9
	8	P.	+	0.7
	9	E.	+	1.4
	10	F.	+	1.4
	14	F.	+	3.0
	15	S.	+	1.9
	21	E.	+	2.9
April	23	F.	+	2.4
May	4	E.	+	1.8
	18	S.	+	2.7
July	11	F.	+	0.6
Mean			+	1.90
Div., Flex., etc. . . .			+	0.16

ε ORIONIS.

	h. m. s.
Right Ascension,	5 29 58
North-Polar Dist.,	91° 16′ 55″.22

1877.				″
April	23	F.	+	3.0
May	4	E.	+	2.5

ε ORIONIS—Continued.

1877.				″
May	15	P.	+	2.7
July	11	F.	+	1.0
Dec.	11	F.	+	1.1
	19	F.	+	0.8
Mean			+	1.85
Div., Flex , etc. . . .			+	0.17

α ORIONIS.

	h. m. s.
Right Ascension,	5 48 31
North-Polar Dist.,	82° 37′ 3″.00

1877.				″
Jan.	28	E.	+	3.8
Feb.	8	P.	+	1.3
	9	E.	+	2.4
May	4	E.	+	3.6
July	11	F.	+	0.3
Dec.	19	F.	+	1.8
Mean			+	2.20
Div., Flex., etc. . . .			−	0.04

α ORIONIS (Ref.).

1877.				″
Feb.	8	P.	+	0.6
	9	E.	+	0.8
Mean			+	0.70
Div., Flex., etc. . . .			+	0.54

22 CAMELOPARDALIS.

	h. m. s.
Right Ascension,	6 5 17
North-Polar Dist.,	20° 38′ 25″.54

1877.				″
Feb.	8	P.	+	1.2
	9	E.	+	2.9
	20	P.	+	2.2
Mean			+	2.10
Div., Flex., etc. . . .			−	1.11

22 CAMELOPARDALIS, S. P.

	h. m. s.
Right Ascension,	6 5 17
North-Polar Dist.,	339° 21′ 34″.46

1877.				″
May	15	P.		0.0
June	23	S.	+	1.8
July	30	P.	+	0.5
Mean			+	0.77
Div., Flex., etc. . . .			−	1.14

μ GEMINORUM.

	h. m. s.
Right Ascension,	6 15 31
North-Polar Dist.,	67° 25′ 30″.18

1877.				″
Feb.	6	F.	+	0.7
	13	E.	+	2.
	17	E.	+	1.
	28	E.	+	3.
July	27	F.	+	0.
Dec.	11	F.	+	0.
Mean			+	1
Div., Flex., etc. . . .			−	0

γ Geminorum.

	h. m. s.
Right Ascension,	6 30 36
	° ′ ″
North-Polar Dist.,	73 29 50.32

1877.				″
Feb.	3	S.	+	2.5
	6	F.	+	2.7
	8	P.	+	1.5
	13	E.	+	3.1
	17	E.	+	2.9
July	27	F.	+	1.8
	29	P.	+	2.5
Dec.	11	F.	+	1.2
Mean			+	2.28
Div., Flex., etc. . . .			−	0.21

γ Geminorum (Ref.).

1877.				″
Feb.	8	P.	+	1.9
Div., Flex., etc. . . .			+	0.33

α Canis Majoris.

	h. m. s.
Right Ascension,	6 39 44
	° ′ ″
North-Polar Dist.,	106 32 54.96

1877.				″
Feb.	3	S.	+	2.2
	6	F.	+	3.2
	13	E.	+	2.5
	17	E.	+	3.7
	21	E.	+	1.5
May	28	E.	+	1.7
July	27	F.	+	1.0
	29	P.	+	2.0
Dec.	11	F.	+	2.0
Mean			+	2.20
Div., Flex., etc. . . .			+	0.10

51 Cephei.

	h. m. s.
Right Ascension,	6 42 15
	° ′ ″
North-Polar Dist.,	2 46 2.93

1877.				″
Jan.	28	E.	+	0.8
Feb.	3	S.	−	0.5
	8	P.	+	0.7
	9	E.	+	1.5
	13	E.	+	0.8
	17	E.	+	0.8
	19	S.	+	0.6
	21	E.	+	1.5
Dec.	11	F.	+	0.2
	19	F.	−	1.0
Mean			+	0.54
Div., Flex., etc. . . .			−	0.95

51 Cephei (Ref.).

1877.				″
Feb.	8	P.	−	1.3
Div., Flex., etc. . . .			+	1.57

51 Cephei, S. P.

	h. m. s.
Right Ascension,	6 42 15
	° ′ ″
North-Polar Dist.,	357 13 57.07

1877.				″
Feb.	7	P.	−	0.1
May	31	P.	+	1.2

51 Cephei, S. P.—Continued.

1877.				″
June	14	F.	+	2.3
	22	F.	−	0.6
	23	S.	+	1.5
	29	F.	+	1.7
July	6	P.	+	0.6
	7	E.	+	2.0
	8	F.	+	1.2
	12	F.	+	3.2
	14	P.	+	0.3
	16	F.	+	1.4
	26	P.	−	1.2
Aug.	17	S.	+	2.9
	18	F.	+	2.8
	20	S.	+	1.9
	21	E.	+	2.7
	27	S.	−	2.8
Mean			+	1.17
Div., Flex., etc. . . .			−	1.01

ε Canis Majoris.

	h. m. s.
Right Ascension,	6 53 48
	° ′ ″
North-Polar Dist.,	118 45 20.96

1877.				″
Jan.	27	P.	+	1.5
	28	E.	+	2.6
	30	S.	+	1.3
Feb.	17	E.	+	2.2
	19	S.	+	2.2
	25	E.	+	0.7
May	28	E.	+	1.2
July	27	F.	−	2.8
	29	P.	−	0.7
Dec.	3	P.	−	0.1
	19	F.	−	0.4
Mean			+	0.70
Div., Flex., etc. . . .			+	0.41

δ Canis Majoris.

	h. m. s.
Right Ascension,	7 3 23
	° ′ ″
North-Polar Dist.,	116 11 55.11

1877.				″
Jan.	27	P.	+	3.1
	28	E.	+	4.3
	30	S.	+	1.0
Feb.	3	S.	+	1.3
	19	S.	+	3.5
	25	E.	+	3.3
July	29	P.	+	3.0
Dec.	3	P.	+	1.7
	19	F.	+	3.1
Mean			+	2.70
Div., Flex., etc. . . .			+	0.37

δ Geminorum.

	h. m. s.
Right Ascension,	7 12 47
	° ′ ″
North-Polar Dist.,	67 47 33.94

1877.				″
Jan.	27	P.	+	1.8
	28	E.	+	2.3
	30	S.	+	1.9
Feb.	3	S.	+	0.4
	13	E.	+	1.6
	19	S.	+	1.2
	25	E.	+	1.0
July	27	F.	+	2.3
	29	P.	+	2.1
Mean			+	1.62
Div., Flex., etc. . . .			−	0.10

δ Geminorum (Ref.).

1877.				″
Feb.	13	E.	−	0.5
Div., Flex., etc. . . .			+	0.39

Piazzi VII–67.

	h. m. s.
Right Ascension,	7 18 4
	° ′ ″
North-Polar Dist.,	21 17 11.81

1877.				″
Jan.	27	P.	−	0.1
Div., Flex., etc. . . .			−	1.08

Piazzi VII–67, S. P.

	h. m. s.
Right Ascension,	7 18 4
	° ′ ″
North-Polar Dist.,	338 42 48.19

1877.				″
July	6	P.	+	1.4
Div., Flex., etc. . . .			−	1.12

α² Geminorum

	h. m. s.
Right Ascension,	7 26 45
	° ′ ″
North-Polar Dist.,	57 50 37.10

1877.				″
Jan.	28	E.	+	1.9
Feb.	6	F.	+	0.2
Mar.	23	S.	+	2.1
June	1	E.	+	2.2
	20	P.	+	1.1
Aug.	9	S.	+	3.2
	15	E.	−	0.1
Dec.	3	P.	+	0.3
Mean			+	1.36
Div., Flex., etc. . . .			+	0.10

α Canis Minoris.

	h. m. s.
Right Ascension,	7 32 52
	° ′ ″
North-Polar Dist.,	84 27 40.97

1877.				″
Jan.	28	E.	+	1.0
Feb.	9	E.	−	0.5
	14	F.	+	2.4
Mar.	23	S.	+	1.5
June	1	E.	+	1.0
	19	S.	+	1.9
	20	P.	+	0.4
	23	S.	+	2.8
Aug.	9	S.	+	2.1
	15	E.	−	0.1
Dec.	3	P.	−	1.0
Mean			+	1.05
Div., Flex., etc. . . .			+	0.09

α Canis Minoris (Ref.).

1877.				″
Feb.	9	E.	−	0.4
Div., Flex., etc. . . .			+	0.57

β Geminorum.

	h. m. s.
Right Ascension,	7 37 47
	° ′ ″
North-Polar Dist.,	61 40 41.67

1877.				″
Jan.	28	E.	+	3.2
Feb.	6	F.	+	1.3
	14	F.	+	3.9
June	19	S.	+	3.9
	20	P.	+	1.7
	23	S.	+	3.4
Aug.	9	S.	+	3.5
	15	E.	+	2.9
Dec.	3	P.	−	0.1
Mean			+	2.63
Div., Flex., etc. . . .			+	0.11

φ Geminorum.

	h. m. s.
Right Ascension,	7 45 58
	° ′ ″
North-Polar Dist.,	62 55 2.84

1877.				″
Mar.	20	F.	+	2.3
Div., Flex., etc. . . .			+	0.07

3 Ursæ Majoris.

	h. m. s.
Right Ascension,	8 0 33
	° ′ ″
North-Polar Dist.,	21 10 0.51

1877.				″
Mar.	15	P.	+	1.8
Div., Flex., etc. . . .			−	1.08

15 Argus.

	h. m. s.
Right Ascension,	8 2 18
	° ′ ″
North-Polar Dist.,	113 57 2.07

1877.				″
Feb.	14	F.	+	3.3
June	23	S.	+	4.4
Mean			+	3.85
Div., Flex., etc. . . .			+	0.32

ε Hydræ.

	h. m. s.
Right Ascension,	8 40 16
	° ′ ″
North-Polar Dist.,	83 7 51.09

1877.				″
Jan.	26	S.	+	2.1
Feb.	6	F.	+	2.1
	9	E.	+	1.9
	10	F.	+	2.7
	25	E.	+	3.1
Mar.	9	E.	+	2.0
	15	P.	+	1.8
	20	F.	+	2.6
	23	S.	+	1.7
April	6	E.	+	3.7
	11	F.	+	3.8
	20	S.	+	3.6
June	23	S.	+	4.4
Mean			+	2.73
Div., Flex., etc. . . .			+	0.01

ι URSÆ MAJORIS.

	h.	m.	s.
Right Ascension,	8	50	47
	°	′	″
North-Polar Dist.,	41	28	37.39

1877.				″
Jan.	26	S.	+	1.4
Feb.	6	F.	+	1.2
	9	E.	+	1.1
Mar.	15	P.	−	0.3
April	6	E.	+	1.2
Mean			+	0.92
Div., Flex., etc.			−	0.81

ι URSÆ MAJORIS (Ref.).

1877.				″
Jan.	26	S.	−	1.0
Feb.	6	F.	−	0.4
April	6	E.	−	1.1
Mean			−	0.83
Div., Flex., etc.			+	1.08

σ^2 URSÆ MAJORIS.

	h.	m.	s.
Right Ascension,	8	59	33
	°	′	″
North-Polar Dist.,	22	22	7.10

1877.				″
Feb.	8	P.	+	0.2
Div., Flex., etc.			−	1.03

σ^2 URSÆ MAJORIS, S. P.

	h.	m.	s.
Right Ascension,	8	59	33
	°	′	″
North-Polar Dist.,	337	37	52.90

1877.				″
Oct.	14	P.	+	2.4
Div., Flex., etc.			−	1.07

κ CANCRI.

	h.	m.	s.
Right Ascension,	9	1	5
	°	′	″
North-Polar Dist.,	78	50	15.65

1877.				″
Jan.	26	S.	+	1.3
Feb.	9	E.	+	3.1
	10	F.	+	3.3
	25	E.	+	1.7
	28	P.	+	1.9
Mar.	9	E.	+	2.9
	15	P.	+	2.0
	30	F.	+	3.5
April	6	E.	+	5.0
	11	F.	+	3.9
	20	S.	+	3.9
	21	P.	+	1.7
Mean			+	2.85
Div., Flex., etc.			−	0.22

1 DRACONIS.

	h.	m.	s.
Right Ascension,	9	19	24
	°	′	″
North-Polar Dist.,	8	7	56.74

1877.				″
Mar.	15	P.	+	3.3
April	21	P.	+	2.6
July	30	P.	+	2.0
Mean			+	2.63
Div., Flex., etc.			−	1.17

1 DRACONIS (Ref.).

1877.				″
Mar.	15	P.	−	0.6
Div., Flex., etc.			+	1.29

1 DRACONIS, S. P.

	h.	m.	s.
Right Ascension,	9	19	24
	°	′	″
North-Polar Dist.,	351	52	3.26

1877.				″
Oct.	11	E.	−	0.6
Nov.	11	P.	−	1.3
Dec.	9	P.	−	0.7
Mean			−	0 87
Div., Flex., etc.			−	1.21

α HYDRÆ.

	h.	m.	s.
Right Ascension,	9	21	33
	°	′	″
North-Polar Dist.,	98	7	34.28

1877.				″
Jan.	26	S.	+	1.5
	30	S.	+	1.9
Feb.	3	S.	+	1.0
	9	E.	+	0.7
	10	F.	+	2.3
	15	S.	+	2.1
	17	E.	+	1.8
	21	E.	+	1.0
	25	E.	+	1.6
	28	P.	+	2.6
Mar.	9	E.	+	2.1
	20	F.	+	2.5
	29	E.	+	1.3
	30	F.	+	3.1
April	6	E.	+	3.6
	12	S.	+	2.0
	14	E.	+	2.4
	20	S.	+	2.4
Mean			+	1.99
Div., Flex., etc.			+	0.05

d URSÆ MAJORIS.

	h.	m.	s.
Right Ascension,	9	23	34
	°	′	″
North-Polar Dist.,	19	37	51.45

1877.				″
Feb.	21	E.	−	0.2
Div., Flex., etc.			−	1.16

d URSÆ MAJORIS, S. P.

	h.	m.	s.
Right Ascension,	9	23	34
	°	′	″
North-Polar Dist.,	340	22	8.55

1877.				″
Oct.	14	P.	+	0.9
Dec.	9	P.	+	0.3
Mean			+	0.60
Div., Flex., etc.			−	1.16

ε LEONIS.

	h.	m.	s.
Right Ascension,	9	38	52
	°	′	″
North-Polar Dist.,	65	39	36.58

1877.				″
Jan.	26	S.	+	0.9
	30	S.	+	1.0
Feb.	3	S.	+	0.4
	6	F.	+	1.4
	7	S.	+	1.8
Mar.	9	E.	+	1.1
	15	P.	+	1.5
	29	E.	+	1.9
April	5	P.	+	0.9
	14	E.	+	2.3
	20	S.	+	3.0
	23	F.	+	1.8
	25	P.	+	1.2
May	18	S.	+	2.8
July	7	E.	+	1.3
Nov.	27	P.	+	1.0
Mean			+	1.52
Div., Flex., etc.			+	0.01

ε LEONIS (Ref.).

1877.				″
Nov.	27	P.		0.0
Div., Flex., etc.			+	0.33

μ LEONIS.

	h.	m.	s.
Right Ascension,	9	45	46
	°	′	″
North-Polar Dist.,	63	24	52.36

1877.				″
Feb.	13	E.	+	1.5
	17	E.	+	0.3
	19	S.	+	0.9
	21	E.	+	0.3
	28	P.	+	1.4
Mar.	15	P.	+	0.9
	30	F.	+	2.3
April	23	F.	+	1.3
	25	P.	+	1.7
Nov.	27	P.	+	0.9
Mean			+	1.15
Div., Flex., etc.			+	0.06

α LEONIS.

	h.	m.	s.
Right Ascension,	10	1	49
	°	′	″
North-Polar Dist.,	77	25	55.44

1877.				″
Jan.	27	P.	+	1.1
	30	S.	+	2.0
Feb.	3	S.	+	0.9
	7	S.	+	2.0
	10	F.	+	4.6
	13	E.	+	1.9
	14	F.	+	4.5
	15	S.	+	0.4
	21	E.	+	0.7
	27	S.	+	1.9
	28	P.	+	0.8
Mar.	7	S.	+	2.2
	9	E.	+	0.7
	15	P.	+	1.7
	29	E.	+	2.0
	30	F.	+	2.4
April	5	P.	+	1.0
	6	E.	+	2.0
	7	F.	+	1.9
	11	F.	+	4.6

α LEONIS—Continued.

1877.				″
April	14	E.	+	2.1
	20	S.	+	2.9
	22	E.	+	3.4
	25	P.	+	1.7
May	18	S.	+	3.0
Nov.	27	P.	+	1.3
Mean			+	2.07
Div., Flex., etc.			−	0.20

α LEONIS (Ref.).

1877.				″
Jan.	27	P.	+	1.9
April	6	E.	+	1.3
Mean			+	1.60
Div., Flex., etc.			+	0.37

32 URSÆ MAJORIS.

	h.	m.	s.
Right Ascension,	10	9	5
	°	′	″
North-Polar Dist.,	24	16	45.57

1877.				″
Jan.	30	S.	−	0.6
Feb.	7	S.	+	0.2
Mar.	30	F.	+	1.3
April	25	P.	+	1.7
Mean			+	0.65
Div., Flex., etc.			−	0.98

32 URSÆ MAJORIS (Ref.).

1877.				″
Jan.	30	S.	−	1.7
Feb.	7	S.	−	3.4
Mean			−	2.55
Div., Flex., etc.			+	1.59

γ^1 LEONIS.

	h.	m.	s.
Right Ascension,	10	13	11
	°	′	″
North-Polar Dist.,	69	32	11.93

1877.				″
Jan.	27	P.	+	2.4
	30	S.	+	3.5
Feb.	3	S.	+	0.4
	6	F.	+	2.3
	7	S.	+	2.2
	10	F.	+	4.6
	13	E.	+	3.2
	14	F.	+	4.5
	15	S.	+	1.7
	17	E.	+	2.6
	27	S.	+	2.9
Mar.	9	E.	+	2.9
	29	E.	+	2.8
	30	F.	+	4.0
April	5	P.	+	2.5
	11	F.	+	5.4
	12	S.	+	3.0
	20	S.	+	4.4
	22	E.	+	4 5
	23	F.	+	3.7
	25	P.	+	3.0
July	7	E.	+	2.4
Oct.	4	S.	+	1.3
Nov.	27	P.	+	2.4
Mean			+	3.02
Div., Flex., etc.			−	0.15

9 DRACONIS.

	h. m. s.
Right Ascension,	10 24 36
	° ′ ″
North-Polar Dist.,	13 39 16.73

1877.		″
Feb. 27	S.	− 0.7
April 20	S.	+ 2.1
23	F.	+ 2.9
Nov. 27	F.	− 0.5
Mean		+ 0.95
Div., Flex., etc. . . .		− 1.11

9 DRACONIS (Ref.).

1877.		″
April 23	F.	− 1.8
Nov. 27	P.	− 1.5
Mean		− 1.65
Div., Flex., etc. . . .		+ 1.34

9 DRACONIS, S. P.

	h. m. s.
Right Ascension,	10 24 36
	° ′ ″
North-Polar Dist.,	346 20 43.27

1877.		″
July 29	S.	+ 2.1
Oct. 24	P.	+ 1.7
Mean		+ 1.90
Div., Flex., etc. . . .		− 1.22

ρ LEONIS.

	h. m. s.
Right Ascension,	10 26 20
	° ′ ″
North-Polar Dist.,	80 3 39.39

1877.		″
April 11	F.	+ 3.5
Div., Flex., etc. . . .		− 0.20

l LEONIS.

	h. m. s.
Right Ascension,	10 42 47
	° ′ ″
North-Polar Dist.,	78 48 14.87

1877.		″
Jan. 27	P.	+ 2.4
Feb. 27	S.	+ 2.0
April 7	F.	+ 1.9
11	F.	+ 2.5
22	E.	+ 2.8
25	P.	+ 2.3
Mean		+ 2.32
Div., Flex., etc. . . .		− 0.22

l LEONIS (Ref.).

1877.		″
Feb. 27	S.	+ 1.4
April 11	F.	+ 2.4
25	P.	+ 0.8
Mean		+ 1.53
Div., Flex., etc. . . .		+ 0.39

α URSÆ MAJORIS.

	h. m. s.
Right Ascension,	10 56 7
	° ′ ″
North-Polar Dist.,	27 35 8.09

1877.		″
Jan. 27	P.	+ 1.5
Feb. 28	P.	+ 0.5
Mar. 7	S.	0.0
April 11	F.	+ 1.2
23	F.	+ 1.6
25	P.	+ 0.7
July 30	P.	+ 0.4
Sept. 9	F.	− 3.0
Mean		+ 0.36
Div., Flex., etc. . . .		− 0.93

α URSÆ MAJORIS (Ref.).

1877.		″
Jan. 27	P.	− 2.8
Feb. 28	P.	− 1.7
Mar. 7	S.	− 2.2
April 11	F.	− 1.5
23	F.	− 2.5
25	P.	− 2.5
July 30	P.	− 1.3
Mean		− 2.07
Div., Flex., etc. . . .		+ 1.53

δ LEONIS.

	h. m. s.
Right Ascension,	11 7 34
	° ′ ″
North-Polar Dist.,	68 48 8.82

1877.		″
Jan. 27	P.	+ 1.2
30	S.	+ 0.9
Mar. 7	S.	+ 1.3
24	P.	+ 1.8
29	E.	+ 2.0
April 12	S.	+ 1.8
23	F.	+ 1.3
May 14	S.	+ 2.1
July 30	P.	+ 1.4
Aug. 10	S.	+ 4.7
Oct. 12	S.	+ 0.2
Mean		+ 1.70
Div., Flex., etc. . . .		− 0.13

δ LEONIS (Ref.).

1877.		″
Jan. 30	S.	+ 0.7
April 23	F.	+ 2.1
Mean		+ 1.40
Div., Flex., etc. . . .		+ 0.38

δ CRATERIS.

	h. m. s.
Right Ascension,	11 13 12
	° ′ ″
North-Polar Dist.,	104 6 46.60

1877.		″
Jan. 27	P.	+ 1.5
Feb. 27	S.	+ 2.2
Mar. 7	S.	+ 2.2
24	P.	+ 1.7
29	E.	+ 2.1
April 7	F.	+ 1.5
May 14	S.	+ 1.6
July 30	P.	+ 1.2
Mean		+ 1.75
Div., Flex., etc. . . .		+ 0.15

τ LEONIS.

	h. m. s.
Right Ascension,	11 21 37
	° ′ ″
North-Polar Dist.,	86 27 59.04

1877.		″
Jan. 27	P.	+ 1.4
Feb. 27	S.	+ 1.2
Mar. 7	S.	+ 2.3
May 12	E.	+ 2.1
Mean		+ 1.75
Div., Flex., etc. . . .		+ 0.12

λ DRACONIS.

	h. m. s.
Right Ascension,	11 24 5
	° ′ ″
North-Polar Dist.,	19 59 26.70

1877.		″
Feb. 27	S.	− 0.3
Mar. 7	S.	− 0.3
April 22	E.	+ 1.1
July 30	P.	− 2.0
Mean		− 0.38
Div., Flex., etc. . . .		− 1.14

λ DRACONIS, (Ref.).

1877.		″
April 22	E.	− 1.5
Div., Flex., etc. . . .		+ 1.49

λ DRACONIS, S. P.

	h. m. s.
Right Ascension,	11 24 5
	° ′ ″
North-Polar Dist.,	340 0 33.30

1877.		″
Nov. 12	E.	+ 0.4
Dec. 14	E.	+ 3.1
Mean		+ 1.75
Div., Flex., etc. . . .		− 1.15

υ LEONIS.

	h. m. s.
Right Ascension,	11 30 39
	° ′ ″
North-Polar Dist.,	90 8 40.54

1877.		″
Feb. 27	S.	+ 1.6
Mar. 24	P.	+ 1.5
April 7	F.	+ 2.0
12	S.	+ 1.5
May 12	E.	+ 1.6
Mean		+ 1.64
Div., Flex., etc. . . .		+ 0.16

β LEONIS.

	h. m. s.
Right Ascension,	11 42 47
	° ′ ″
North-Polar Dist.,	74 44 24.32

1877.		″
Feb. 20	P.	+ 1.6
27	S.	+ 2.8
Mar. 29	E.	+ 2.2
30	F.	+ 3.4
April 23	F.	+ 2.8
May 12	E.	+ 2.7
14	S.	+ 3.2
July 30	P.	+ 2.6

β LEONIS—Continued.

1877.		″
Aug. 10	S.	+ 5.9
Oct. 4	S.	+ 1.7
12	S.	0.0
22	E.	+ 2.6
Mean		+ 2.62
Div., Flex., etc. . . .		− 0.19

β LEONIS (Ref.).

1877.		″
Feb. 20	P.	+ 1.7
Div., Flex., etc. . . .		+ 0.34

γ URSÆ MAJORIS.

	h. m. s.
Right Ascension,	11 47 21
	° ′ ″
North-Polar Dist.,	35 37 17.05

1877.		″
Feb. 20	P.	+ 0.6
Mar. 23	S.	+ 1.4
24	P.	+ 1.6
April 14	E.	+ 2.2
May 12	E.	+ 1.1
18	S.	+ 2.6
Oct. 4	S.	+ 1.0
Mean		+ 1.50
Div., Flex., etc. . . .		− 0.93

γ URSÆ MAJORIS (Ref.).

1877.		″
Feb. 20	P.	+ 0.3
Mar. 24	P.	− 1.0
April 14	E.	− 1.1
May 12	E.	− 0.3
18	S.	− 2.3
Mean		− 0.88
Div., Flex., etc. . . .		+ 1.29

o VIRGINIS.

	h. m. s.
Right Ascension,	11 58 57
	° ′ ″
North-Polar Dist.,	80 35 0.88

1877.		″
Feb. 20	P.	+ 1.6
April 7	F.	+ 1.6
11	F.	+ 2.8
12	S.	+ 1.7
May 18	S.	+ 1.1
23	P.	+ 2.1
Mean		+ 1.82
Div., Flex., etc. . . .		− 0.18

o VIRGINIS (Ref.).

1877.		″
Feb. 20	P.	+ 1.8
April 12	S.	+ 0.5
May 18	S.	+ 1.3
Mean		+ 1.20
Div., Flex., etc. . . .		+ 0.44

4 DRACONIS.

	h. m. s.
Right Ascension,	12 6 25
	° ′ ″
North-Polar Dist.,	11 42 2.44

1877.		″
Feb. 20	P.	− 1.2
April 5	P.	+ 0.8
25	P.	+ 0.6
May 23	P.	− 0.3
Mean		− 0.02
Div., Flex., etc. . . .		− 1.10

4 DRACONIS (Ref.).

1877.				″
Feb.	20	P.	−	2.6
April	5	P.	−	2.8
Mean			−	2.70
Div., Flex., etc.			+	1.36

4 DRACONIS, S. P.

	h. m. s.
Right Ascension,	12 6 25
North-Polar Dist.,	348° 17′ 57″.56

1877.				″
Nov.	19	P.	+	2.7
Div., Flex., etc.			−	1.29

η VIRGINIS.

	h. m. s.
Right Ascension,	12 13 37
North-Polar Dist.,	89° 58′ 58″.44

1877.				″
Mar.	24	P.	+	0.9
	30	F.	+	1.1
April	14	E.	+	2.6
May	23	P.	+	1.7
July	15	E.	+	1.2
Mean			+	1.50
Div., Flex., etc.			+	0.16

η VIRGINIS (Ref.).

1877.				″
Mar.	24	P.	+	1.2
Div., Flex., etc.			+	0.48

β CORVI.

	h. m. s.
Right Ascension,	12 27 56
North-Polar Dist.,	112° 42′ 56″.97

1877.				″
Feb.	20	P.	+	2.6
Mar.	23	S.	+	2.7
	29	E.	+	2.6
April	12	S.	+	3.8
	14	E.	+	3.2
	22	E.	+	2.8
May	23	P.	+	2.5
July	15	E.	+	2.4
Mean			+	2.82
Div., Flex., etc.			+	0.29

κ DRACONIS.

	h. m. s.
Right Ascension,	12 28 13
North-Polar Dist.,	19° 32′ 2″.41

1877.				″
April	5	P.	−	0.9
	25	P.	+	0.2
Mean			−	0.35
Div., Flex., etc.			−	1.16

κ DRACONIS (Ref.).

1877.				″
April	5	P.	−	1.8
Div., Flex., etc.			+	1.46

κ DRACONIS, S. P.

	h. m. s.
Right Ascension,	12 28 13
North-Polar Dist.,	340° 27′ 57″.59

1877.				″
July	29	S.	+	1.9
Nov.	17	F.	+	3.6
	19	P.	+	2.9
Mean			+	2.80
Div., Flex., etc.			−	1.16

32² CAMELOPARDALIS.

	h. m. s.
Right Ascension,	12 48 15
North-Polar Dist.,	5° 55′ 8″.26

1877.				″
Mar.	15	P.	−	1.5
April	25	P.	+	0.3
May	23	P.	−	0.5
Mean			−	0.57
Div., Flex., etc.			−	1.03

32² CAMELOPARDALIS, S. P.

	h. m. s.
Right Ascension,	12 48 15
North-Polar Dist.,	354° 4′ 51″.74

1877.				″
Sept.	26	P.	+	3.0
Oct.	6	F.	+	3.0
	15	E.	+	3.1
Nov.	19	P.	+	3.2
Dec.	14	E.	+	3.7
Mean			+	3.20
Div., Flex., etc.			−	1.04

12² CANUM VENATICORUM.

	h. m. s.
Right Ascension,	12 50 16
North-Polar Dist.,	51° 1′ 0″.66

1877.				″
Feb.	20	P.	+	1.0
Mar.	7	S.	+	1.9
	15	P.	+	1.5
	23	S.	+	2.6
	24	P.	+	2.0
	29	E.	+	1.5
April	5	P.	+	1.6
	7	F.	+	2.7
	22	E.	+	2.6
May	2	S.	+	0.7
	14	S.	+	1.8
	15	P.	+	2.2
	17	F.	+	1.8
	22	S.	+	2.5
	28	E.	+	1.6
	31	P.	+	1.1
June	19	S.	+	2.1
Sept.	10	F.	−	0.3
	12	S.	+	0.5
Nov.	11	E.	−	0 6
	15	E.	−	0.5
Mean			+	1.44
Div., Flex., etc.			−	0.21

θ VIRGINIS.

	h. m. s.
Right Ascension,	13 3 35
North-Polar Dist.,	94° 52′ 53″.86

1877.				″
Feb.	20	P.	+	1.6
Mar.	23	S.	+	1.6
	24	P.	+	1.8
April	7	F.	+	3.0
	12	S.	+	1.9
	14	E.	+	3.6
	22	E.	+	2.3
May	15	P.	+	2.7
	17	F.	+	1.4
	28	E.	+	2.8
	31	P.	+	2.0
June	1	E.	+	2.6
	19	S.	+	3.1
Mean			+	2.34
Div., Flex., etc.			+	0.24

α VIRGINIS.

	h. m. s.
Right Ascension,	13 18 43
North-Polar Dist.,	100° 31′ 6″.40

1877.				″
Feb.	20	P.	+	1.7
Mar.	24	P.	+	1.7
April	22	E.	+	2.4
May	15	P.	+	2.1
	17	F.	+	2.4
	18	S.	+	1.4
	22	S.	+	2.4
	28	E.	+	2.9
	31	P.	+	0.8
June	1	E.	+	2.2
July	15	E.		0.0
Oct.	31	P.	−	1.9
Nov.	11	E.	−	0.1
	15	E.	−	0.6
	19	E.		0.0
Mean			+	1.16
Div., Flex., etc.			+	0.11

ζ VIRGINIS.

	h. m. s.
Right Ascension,	13 28 26
North-Polar Dist.,	89° 57 57″.78

1877.				″
May	15	P.	+	2.4
	17	F.	+	1.9
	18	S.	+	3.3
	28	E.	+	2.3
	31	P.	+	1.7
June	1	E.	+	2.3
	19	S.	+	2.9
July	15	E.	+	3.5
Sept.	10	F.	+	3.6
Mean			+	2.66
Div., Flex., etc.			+	0.16

η URSÆ MAJORIS.

	h. m. s.
Right Ascension,	13 42 42
North-Polar Dist.,	40° 4′ 20″.24

1877.				″
May	2	S.	+	1.1
	15	P.	+	1.3
	24	E.	+	1.6
	28	E.	+	2.0
June	23	S.	+	1.5
Sept.	10	F.	−	1.6

η URSÆ MAJORIS—Continued.

1877.				″
Nov.	6	F.	−	2.2
	11	E.	+	0.4
	12	F.	−	0.3
	15	F.	+	0.1
	19	E.		0.0
Mean			+	0.35
Div., Flex., etc.			−	0.83

η URSÆ MAJORIS (Ref.).

1877.				″
May	15	P.	−	0.4
	24	E.	−	0.1
	28	E.	−	0.5
June	23	S.	−	0.8
Nov.	11	E.	+	0.4
	15	E.	−	0.8
	19	E.	−	1.2
Mean			−	0.49
Div., Flex., etc.			+	1.12

η BOOTIS.

	h. m. s.
Right Ascension,	13 48 50
North-Polar Dist.,	70° 59′ 4″.77

1877.				″
April	12	S.	+	2.4
May	1	F.	+	1.9
	2	S.	+	1.2
	15	P.	+	2.6
	17	F.	+	1.0
	18	S.	+	3.0
	22	S.	+	3.0
	24	E.	+	3.4
	28	E.	+	3.1
	31	P.	+	1.9
June	1	E.	+	2.0
	11	S.	+	2.8
	19	S.	+	3.2
	23	S.	+	2.5
July	15	E.	+	3.0
Nov.	2	F.	−	0.2
	6	F.	−	0.1
	11	E.	+	0.8
	15	E.	+	1.2
	19	E.	+	1.0
Mean			+	1.98
Div., Flex., etc.			−	0.16

α DRACONIS.

	h. m. s.
Right Ascension,	14 1 4
North-Polar Dist.,	25° 2′ 11″.11

1877.				″
April	11	F.	+	0.2
May	15	P.	−	0.1
Nov.	12	F.	−	1.3
Mean			−	0.40
Div., Flex., etc.			−	0.97

α DRACONIS (Ref.).

1877.				″
April	11	F.	−	4.0
Div., Flex., etc.			+	1.55

α DRACONIS, S. P.

	h. m. s.
Right Ascension,	14 1 4
North-Polar Dist.,	334° 57′ 45″.8

1877.				″
Nov.	19	P.	+	1.
Div., Flex., etc.			−	0.

α Bootis.

	h. m. s.
Right Ascension,	14 10 3
North-Polar Dist.,	70° 10′ 33″.66

1877.				″
April	11	F.	+	3.4
	12	S.	+	3.4
May	1	F.	+	1.8
	2	S.	+	2.6
	12	E.	+	3.2
	15	P.	+	3.2
	24	E.	+	2.9
June	11	S.	+	2.9
	23	S.	+	3.5
July	16	F.	+	2.7
Oct.	5	S.	+	3.0
Nov.	2	F,	+	4.1
	6	F.	+	3.0
	11	E.	+	1.3
	12	F.	+	0.8
	15	E.	+	2.0
	16	F.	−	1.5
	18	P.	+	2.1
	19	E.	+	1.5
Mean			+	2.42
Div., Flex., etc.			−	0.15

α Bootis (Ref.).

1877.				″
May	12	E.	+	0.7
	15	P.	+	1.3
Nov.	11	E.	+	0.8
	12	F.	+	2.7
	15	E.	+	2.2
Mean			+	1.54
Div., Flex., etc.			+	0.36

θ Bootis.

	h. m. s.
Right Ascension,	14 21 0
North-Polar Dist.,	37° 34′ 47″.88

1877.				″
Nov.	12	F.	+	1.5
Div., Flex., etc.			−	0.87

5 Ursæ Minoris.

	h. m. s.
Right Ascension,	14 27 48
North-Polar Dist.,	13° 45′ 27″.69

1877.				″
Mar.	15	P.	−	1.6
June	20	P.	−	0.7
Mean			−	1.15
Div., Flex., etc.			−	1.12

5 Ursæ Minoris, S. P.

	h. m. s.
Right Ascension,	14 27 48
North-Polar Dist.,	346° 14′ 32″.31

1877.				″
Nov.	2	S.	−	0.2
	19	P.	+	2.0
Mean			+	0.90
Div., Flex., etc.			−	1.22

ε Bootis.

	h. m. s.
Right Ascension,	14 39 37
North-Polar Dist.,	62° 24′ 21″.98

1877.				″
Mar.	15	P.	+	1.3
April	23	F.	+	0.7
May	12	E.	+	2.7
	15	P.	+	1.7
	17	F.	+	2.5
	24	P.	−	1.0
	31	P.	+	1.3
June	11	S.	+	1.8
July	16	F.	+	1.1
Oct.	5	S.	+	2.2
	13	S.	+	0.7
	18	P.	+	0.3
Dec.	13	E.	+	0.6
Mean			+	1.22
Div., Flex., etc.			+	0.09

ε Bootis (Ref.).

1877.				″
Mar.	15	P.	+	1.3
Div., Flex., etc.			+	0.28

α^2 Libræ.

	h. m. s.
Right Ascension,	14 44 5
North-Polar Dist,	105° 31′ 44″.87

1877.				″
Mar.	30	F.	+	3.5
April	11	F.	+	4.1
May	2	S.	+	3.3
	12	E.	+	2.4
	15	P.	+	2.4
	17	F.	+	2.1
	24	E.	+	2.6
	31	P.	+	1.1
June	11	S.	+	1.9
July	16	F.	+	1.7
Oct.	5	S.	+	3.0
Mean			+	2.55
Div., Flex., etc.			+	0.12

β Ursæ Minoris.

	h. m. s.
Right Ascension,	14 51 5
North-Polar Dist.,	15° 20′ 32″.16

1877.				″
Mar.	15	P.	−	0.6
April	25	P.	−	0.7
May	15	P.	+	0.1
	24	E.	+	0.9
July	16	F.	−	0.3
Oct.	5	S.	−	0.1
Nov.	1	P.	−	0.8
Dec.	13	E.	−	0.9
Mean			−	0.30
Div., Flex., etc.			−	1.15

β Ursæ Minoris (Ref.).

1877.				″
Mar.	15	P.	−	2.0
Dec.	13	E.	−	3.0
Mean			−	2.50
Div., Flex., etc.			+	1.35

β Ursæ Minoris, S. P.

	h. m. s.
Right Ascension,	14 51 5
North-Polar Dist.,	344° 39′ 27″.84

1877.				″
June	7	P.	+	4.6
Dec.	18	E.	+	3.5
Mean			+	4.05
Div., Flex., etc.			−	1.23

β Bootis.

	h. m. s.
Right Ascension,	14 57 19
North-Polar Dist.,	49° 7′ 24″.16

1877.				″
Feb.	7	S.	+	0.3
May	12	E.	+	1.5
	14	S.	−	0.2
	15	P.	+	0.5
	31	P.	−	0.1
June	11	S.	+	0.4
July	7	E.	+	1.1
	16	F.	+	0.5
Oct.	5	S.	+	0.2
Nov.	18	P.	+	0.3
Dec.	2	P.	−	0.5
	13	E.	+	0.1
Mean			+	0.34
Div., Flex., etc.			−	0.37

β Libræ.

	h. m. s.
Right Ascension,	15 10 23
North-Polar Dist.,	98° 55′ 38″.57

1877.				″
May	14	S.	+	2.4
	17	F.	+	4.1
	28	E.	+	2.7
	31	P.	+	0.9
July	7	E.	+	2.3
	13	S.	+	2.7
	16	F.	+	2.9
Oct.	5	S.	+	3.7
	13	S.	+	3.3
Dec.	13	E.	+	1.9
	17	E.	+	1.8
Mean			+	2.61
Div., Flex., etc.			+	0.05

μ^1 Bootis.

	h. m. s.
Right Ascension,	15 19 51
North-Polar Dist.,	52° 11′ 25″.32

1877.				″
Feb.	7	S.	+	0.3
May	1	F.	+	0.9
	14	S.	+	1.0
	28	E.	+	1.9
	31	P.	+	0.9
July	7	E.	+	0.8
	13	S.	+	3.4
Dec.	17	E.	+	0.6
Mean			+	1.22
Div., Flex., etc.			−	0.05

γ^2 Ursæ Minoris.

	h. m. s.
Right Ascension,	15 20 56
North-Polar Dist.,	17° 41′ 41″.47

1877.				″
Mar.	15	P.	+	1.6
April	25	P.	−	0.1
May	17	F.	+	2.2
Nov.	18	P.	+	0.7
Dec.	13	E.	+	0.6
Mean			+	1.00
Div., Flex., etc.			−	1.19

γ^2 Ursæ Minoris (Ref.).

1877.				″
Mar.	15	P.	+	0.1
April	25	P.	+	1.2
May	17	F.	−	3.0
Mean			−	0.57
Div., Flex., etc.			+	1.35

γ^2 Ursæ Minoris, S. P.

	h. m. s.
Right Ascension,	15 20 56
North-Polar Dist.,	342° 18′ 18″.53

1877.				″
Dec.	31	E.	−	0.27
Div., Flex., etc.			−	1.21

α Coronæ Borealis.

	h. m. s.
Right Ascension,	15 29 59
North-Polar Dist.,	62° 52′ 11″.95

1877.				″
April	25	P.	+	1.7
May	1	F.	−	0.5
	2	S.	+	1.8
	17	F.	+	2.1
	24	E.	+	2.2
	28	E.	+	1.5
	31	P.	+	2.0
July	7	E.	+	2.0
	13	S.	+	2.9
Oct.	13	S.	+	2.8
Dec.	2	P.	+	0.2
	13	E.	+	1.9
Mean			+	1.72
Div., Flex., etc.			+	0.07

α Coronæ Borealis (Ref.).

1877.				″
April	25	P.	+	1.9
May	24	E.	+	0.7
July	7	E.	+	1.8
Mean			+	1.47
Div., Flex., etc.			+	0.29

α Serpentis.

	h. m. s.
Right Ascension,	15 38 13
North-Polar Dist.,	83° 11′ 9″.00

1877.				″
April	25	P.	+	1.8
May	2	S.	+	2.3
	17	F.	+	2.3

α SERPENTIS—Continued.

1877.				″
May	23	P.	+	1.3
	28	E.	+	3.1
June	1	E.	+	2.6
	20	P.	+	2.6
	22	F.	−	0.4
July	13	S.	+	2.7
Oct.	13	S.	+	2.3
Nov.	3	F.	+	3.1
Dec.	2	P.	+	1.2
	7	F.	+	0.6
	17	E.	+	0.9
Mean			+	1.89
Div., Flex., etc.			+	0.02

α SERPENTIS (Ref.).

1877.				″
April	25	P.	+	1.8
May	23	P.	+	1.5
June	1	E.	+	1.9
Mean			+	1.73
Div., Flex., etc.			+	0.56

ε SERPENTIS.

	h. m. s.
Right Ascension,	15 44 41
North-Polar Dist.,	85° 9′ 1″.89

1877.				″
Mar.	15	P.	+	1.8
May	2	S.	+	1.4
	17	F.	+	1.9
	28	E.	+	2.6
June	20	P.	+	0.5
	22	F.	−	0.9
July	13	S.	+	2.7
	16	F.	+	2.2
Oct.	13	S.	+	3.1
Dec.	2	P.	+	0.5
	17	E.	+	1.8
Mean			+	1.60
Div., Flex., etc.			+	0.10

ζ URSÆ MINORIS.

	h. m. s.
Right Ascension,	15 48 39
North-Polar Dist.,	11° 49′ 40″.89

1877.				″
Mar.	15	P.	+	1.2
April	25	P.	+	1.9
May	23	P.	+	1.8
June	20	P.	+	1.6
July	7	E.	+	4.2
	16	F.	+	1.2
Nov.	19	P.	+	1.0
Mean			+	1.84
Div., Flex., etc.			−	1.10

ζ URSÆ MINORIS (Ref.).

1877.				″
April	25	P.	−	0.1
July	7	E.	+	1.3
Mean			+	0.60
Div., Flex., etc.			+	1.36

ζ URSÆ MINORIS, S. P.

	h. m. s.
Right Ascension,	15 48 29
North-Polar Dist.,	348° 10′ 19″.11

1877.				″
Dec.	3	P.	+	0.8
	18	E.	+	1.2
Mean			+	1.00
Div., Flex., etc.			−	1.29

ε CORONÆ BOREALIS.

	h. m. s.
Right Ascension,	15 52 30
North-Polar Dist.,	62° 45′ 51″.92

1877.				″
May	17	F.	+	2.1
	23	P.	+	2.1
Mean			+	2.10
Div., Flex., etc.			+	0.08

ε CORONÆ BOREALIS (Ref.).

1877.				″
May	17	F.	+	2.8
Div., Flex., etc.			+	0.29

δ SCORPII.

	h. m. s.
Right Ascension,	15 53 4
North-Polar Dist.,	112° 16′ 9″.78

1877.				″
Feb.	7	S.	+	2.5
Mar.	15	P.	+	3.7
Mean			+	3.10
Div., Flex., etc.			+	0.27

β¹ SCORPII.

	h. m. s.
Right Ascension,	15 58 17
North-Polar Dist.,	109° 28′ 1″.27

1877.				″
Feb.	7	S.	+	0.5
Mar.	15	P.	+	1.3
May	22	S.	+	2.2
	23	P.	+	0.1
July	16	F.	+	1.9
Mean			+	1.20
Div., Flex., etc.			+	0.13

GROOMBRIDGE 2320.

	h. m. s.
Right Ascension,	16 5 59
North-Polar Dist.,	21° 51′ 56″.55

1877.				″
Mar.	15	P.	+	1.3
Div., Flex., etc.			−	1.05

δ OPHIUCHI.

	h. m. s.
Right Ascension,	16 7 54
North-Polar Dist.,	93° 22′ 32″.67

1877.				″
Feb.	7	S.	+	1.6
Mar.	15	P.	+	2.3
April	25	P.	+	1.2
May	22	S.	+	3.3
	24	E.	+	2.6
Dec.	14	F.	−	3.1
Mean			+	1.32
Div., Flex., etc.			+	0.26

τ HERCULIS.

	h. m. s.
Right Ascension,	16 16 2
North-Polar Dist.,	43° 23′ 24″.39

1877.				″
July	12	F.	+	1.3
Nov.	7	F.	+	1.6
Dec.	14	F.	−	0.7
Mean			+	0.40
Div., Flex., etc.			−	0.78

α SCORPII.

	h. m. s.
Right Ascension,	16 21 52
North-Polar Dist.,	116° 9′ 25″.25

1877.				″
Feb.	7	S.	+	0.8
Mar.	15	P.	+	2.6
April	25	P.	+	1.2
May	18	S.	+	3.3
	22	S.	+	1.0
	24	E.	+	1.2
June	1	E.	+	2.1
	14	F.	+	1.9
	28	P.	+	1.3
July	12	F.	−	0.4
	14	P.	−	0.2
	16	F.	+	2.9
Nov.	7	F.	+	0.7
Dec.	14	F.	−	4.4
Mean			+	1.00
Div., Flex., etc.			+	0.37

η DRACONIS.

	h. m. s.
Right Ascension,	16 22 20
North-Polar Dist.,	28° 12′ 25″.34

1877.				″
May	15	P.	+	1.2
Div., Flex., etc.			−	0.93

A DRACONIS.

	h. m. s.
Right Ascension,	16 28 14
North-Polar Dist.,	20° 57′ 56″.89

1877.				″
Mar.	15	P.	+	0.8
July	12	F.	+	0.2
Mean			+	0.50
Div., Flex., etc.			−	1.09

ζ OPHIUCHI.

	h. m. s.
Right Ascension,	16 30 23
North-Polar Dist.,	100° 18′ 57″.11

1877.				″
Feb.	7	S.	+	2.6
April	25	P.	+	1.6
June	1	E.	+	3.0
	25	P.	+	1.9
	28	P.	+	1.5
	29	F.	+	3.4
July	6	P.	+	2.6
	12	F.	+	1.5
	14	P.	+	1.8
Nov.	7	F.	+	2.5
Mean			+	2.24
Div., Flex., etc.			+	0.10

η HERCULIS.

	h. m. s.
Right Ascension,	16 38 41
North-Polar Dist.,	50° 50′ 32″.72

1877.				″
April	25	P.	+	2.1
May	18	S.	+	2.2
	24	E.	+	3.5
June	14	F.	+	2.5
	23	S.	+	2.6
	25	P.	+	2.7
	28	P.	+	1.6
July	6	P.	+	2.2
	12	F.	+	2.8
	14	P.	+	1.1
Nov.	1	P.	+	2.6
	7	F.	+	2.6
	13	F.	+	3.8
Mean			+	2.48
Div., Flex., etc.			−	0.22

κ OPHIUCHI.

	h. m. s.
Right Ascension,	16 51 51
North-Polar Dist.,	80° 25′ 54″.83

1877.				″
April	25	P.	+	2.3
May	17	F.	+	5.0
	18	S.	+	3.3
June	1	E.	+	3.7
	14	F.	+	3.6
	22	F.	+	2.1
	25	P.	+	3.1
July	6	P.	+	2.9
	12	F.	+	3.4
	14	P.	+	2.4
	26	P.	+	3.4
Nov.	1	P.	+	2.8
	17	F.	+	0.4
Mean			+	2.9
Div., Flex., etc.			−	0.8

κ OPHIUCHI (Ref.).

1877.				″
June	14	F.	+	1
Div., Flex., etc.			+	0

d Herculis.

	h. m. s.
Right Ascension,	16 57 4
North-Polar Dist.,	56° 15′ 7″.58

1877.				″
May	14	S.	+	1.3
June	22	F.	+	1.4
	29	F.	+	2.8
Mean			+	1.83
Div., Flex., etc.			+	0.18

ε Ursæ Minoris.

	h. m. s.
Right Ascension,	16 58 38
North-Polar Dist.,	7° 45′ 47″.82

1877.				″
April	25	P.	+	1.2
May	15	P.	+	1.3
June	25	P.	+	1.4
	28	P.	+	0.3
July	6	P.	+	1.0
	14	P.	+	0.6
	16	F.	+	1.3
	26	P.	+	2.0
	30	P.	+	0.7
Nov.	19	P.	+	0.3
Dec.	3	P.	−	0.2
Mean			+	0.90
Div., Flex., etc.			−	1.16

ε Ursæ Minoris, S. P.

	h. m. s.
Right Ascension,	16 58 38
North-Polar Dist.,	352° 14′ 12″.18

1877.				″
Jan	29	F.	+	1.6
Feb.	8	P.	+	2.3
	20	P.	+	1.6
Aug.	3	P.	+	1.4
Oct.	24	P.	+	0.8
Dec.	3	P.	+	0.2
	19	F.	+	1.5
Mean			+	1.34
Div., Flex., etc.			−	1.18

a¹ Herculis.

	h. m. s.
Right Ascension,	17 9 2
North-Polar Dist.,	75° 28′ 3″.83

1877.				″
Feb.	7	S.	+	1.8
May	15	P.	+	2.0
June	14	F.	+	2.4
	23	S.	+	1.5
	25	P.	+	2.3
	29	F.	+	3.5
July	6	P.	+	2.5
	12	F.	+	1.7
	14	P.	+	1.5
	26	P.	+	2.5
	30	P.	+	1.6
Nov.	3	F.	+	3.2
	17	F.		0.0
Mean			+	2.04
Div., Flex., etc.			−	0.17

a¹ Herculis (Ref.).

1877.				″
May	15	P.	+	1.4
Div., Flex., etc.			+	0.34

44 Ophiuchi.

	h. m. s.
Right Ascension,	17 18 52
North-Polar Dist.,	114° 3′ 34″.16

1877.				″
July	12	F.	+	2.2
	26	P.	+	2.4
Mean			+	2.30
Div., Flex., etc.			+	0.32

β Draconis.

	h. m. s.
Right Ascension,	17 27 39
North-Polar Dist.,	37° 36′ 25″ 33

1877.				″
Feb.	7	S.	+	1.1
Div., Flex., etc.			−	0 87

β Draconis (Ref.).

1877.				″
Feb.	7	S.	+	0.5
Div., Flex., etc.			+	1.21

α Ophiuchi.

	h. m. s.
Right Ascension,	17 29 13
North-Polar Dist.,	77° 20′ 55″.26

1877.				″
Jan.	24	F.	+	2.5
	25	S.	+	0.2
May	28	E.	+	3.7
June	23	S.	+	1.5
	25	P.	+	2.4
July	26	P.	+	2.5
Aug.	17	S.	+	2.7
Nov.	3	F.	+	2.1
	13	F.	+	2.8
	16	E.	+	3.5
	17	F.	−	2.0
Mean			+	1.99
Div., Flex., etc.			−	0.19

ω Draconis.

	h. m. s.
Right Ascension,	17 37 40
North-Polar Dist.,	21° 11′ 9″.36

1877.				″
Jan.	24	F.	−	0.2
June	25	S.	−	0.6
July	8	F.	−	2.6
	12	F.	−	0.5
Nov.	7	F.	−	0.9
Mean			−	0.96
Div., Flex., etc.			−	1.08

ω Draconis, S. P.

	h. m. s.
Right Ascension,	17 37 40
North-Polar Dist.,	338° 48′ 50″.64

1877.				″
Feb.	8	P.	+	2.8
Div., Flex., etc.			−	1.12

μ Herculis.

	h. m. s.
Right Ascension	17 41 39
North-Polar Dist.,	62° 12′ 20″.99

1877.				″
Jan.	24	F.	+	3.8
	25	S.	+	0.9
	29	S.	+	1.0
Feb.	7	S.	+	1.7
May	15	P.	+	1.2
June	19	S.	+	1.0
	23	S.	+	1.8
July	8	F.	+	2.9
	12	F.	+	1.5
	26	P.	+	2.4
	30	P.	+	1.2
Aug.	17	S.	+	2.0
Nov.	3	F.	+	1.7
	7	F.	+	0.5
	12	E.	+	1.8
	13	F.	+	3.3
	17	F.	−	0.6
Mean			+	1.65
Div., Flex., etc.			+	0.09

ψ¹ Draconis.

	h. m. s.
Right Ascension,	17 44 8
North-Polar Dist.,	17° 47′ 28″.49

1877.				″
June	25	P.	+	1.5
	29	F.	−	0.3
Mean			+	0.60
Div., Flex., etc			−	1.19

ψ¹ Draconis, S. P.

	h. m. s.
Right Ascension,	17 44 8
North-Polar Dist.,	342° 12′ 31″.51

1877.				″
Jan.	28	E.	+	3.5
Dec.	3	P.	+	0.4
Mean			+	1.95
Div., Flex., etc.			−	1.22

γ Draconis.

	h. m. s.
Right Ascension,	17 53 45
North-Polar Dist.,	38° 29′ 45″.73

1877.				″
Jan.	25	S.	+	1.3
	29	S.	+	0.2
	30	E.	+	1.4
Feb.	15	P.	+	1.1
May	15	P.	+	1.2
	31	P.	+	0.2
Nov.	7	F.	−	0.1
	12	E.	+	1.4
	13	F.	+	0.8
Dec.	3	P.	−	0.3
Mean			+	0.72
Div., Flex., etc.			−	0.86

γ Draconis (Ref.).

1877.				″
Jan.	25	S.	−	0.3
	29	S.	−	0.8
	30	E.	−	0.2
Feb.	15	P.	−	0.6
May	15	P.		0.0
	31	P.	−	0.3
Nov.	12	E.	−	1.9
	13	F.	−	2.1
Dec.	3	P.	−	1.1
Mean			−	0.81
Div., Flex., etc.			+	1.19

γ² Sagittarii.

	h. m. s.
Right Ascension,	17 57 54
North-Polar Dist.,	120° 25′ 24″.52

1877.				″
May	15	P.	+	0.1
	28	E.	+	0.5
June	19	S.	−	1.0
	23	S.	−	0.8
	29	F.	+	1.5
July	16	F.	−	0.2
	26	P.	−	0.2
	30	P.	−	0.6
Aug.	17	S.		0.0
	20	S.	+	0.1
	21	E.	+	0.4
Nov.	13	F.	+	1.3
Mean			+	0.09
Div., Flex., etc.			+	0.41

μ¹ Sagittarii.

	h. m. s.
Right Ascension,	18 6 24
North-Polar Dist.,	111° 5′ 19″.87

1877.				″
June	19	S.	+	0.3
	22	F.	+	0.5
July	16	F.	−	0.4
	26	P.	+	0.9
Aug.	17	S.	+	0.8
	18	F.	+	1.3
	20	S.	+	1.5
	21	E.	+	0.1
Mean			+	0.62
Div., Flex., etc.			+	0.21

δ Ursæ Minoris.

	h. m. s.
Right Ascension,	18 12 0
North-Polar Dist.,	3° 23′ 30″.35

1877.				″
Feb.	7	S.	−	0.2
	7	P.	−	0.4
	15	P.	−	0.3
May	15	P.	+	0.6
	31	P.	+	0.2
June	14	F.	+	0.8
	19	S.	+	0.2
	22	F.	+	0.8
	23	S.	+	1.9
	25	P.	+	0.6
	28	P.	+	0.3
	29	F.	+	1.4
July	6	P.	+	0.5
	7	E.	+	0.9
	8	F.	+	1.5
	12	F.	+	1.5

δ URSÆ MINORIS—Continued.

1877.			″
July	14	P.	+ 0.5
	16	F.	+ 0.1
	26	P.	+ 1.1
	30	P.	+ 0.4
Aug.	11	E.	+ 0.3
	17	S.	+ 0.7
	20	S.	+ 1.0
	27	S.	+ 2.1
Nov.	12	E.	− 2.0
	13	F.	− 0.9
Dec.	3	P.	− 1.0
Mean			+ 0.47
Div., Flex., etc.			− 0.94

δ URSÆ MINORIS, S. P.

	h.	m.	s.
Right Ascension,	18	12	0
North-Polar Dist.,	356°	36′	29″.65

1877.			″
Jan.	25	F.	+ 2.2
	26	S.	+ 2.1
	28	E.	+ 3.3
	30	S.	+ 3.1
Feb.	7	S.	+ 3.1
	8	P.	+ 1.2
	9	E.	+ 2.5
	13	E.	+ 2.9
	15	S.	+ 1.5
	17	E.	+ 2.8
	20	P.	+ 1.9
	21	E.	+ 1.4
July	29	P.	+ 1.8
Dec.	3	P.	+ 1.5
	19	F.	+ 2.1
Mean			+ 2.23
Div., Flex., etc.			− 1.02

η SERPENTIS.

	h.	m.	s.
Right Ascension,	18	14	57
North-Polar Dist.,	92°	55′	43″.32

1877.			″
June	28	P.	+ 2.4
July	13	S.	+ 4.5
	30	P.	+ 2.4
Aug.	20	S.	+ 2.1
	21	E.	+ 1.9
Nov.	7	F.	+ 0.8
	12	E.	+ 1.7
	13	F.	+ 0.6
	19	P.	+ 1.9
Mean			+ 2.03
Div., Flex., etc.			+ 0.26

1 AQUILÆ.

	h.	m.	s.
Right Ascension,	18	28	31
North-Polar Dist.,	98°	19′	40″.93

1877.			″
Feb.	15	P.	+ 1.2
June	14	F.	+ 1.5
	23	S.	+ 1.4
July	8	F.	+ 2.4
	13	S.	+ 4.4
	16	F.	+ 1.6
Aug.	17	S.	+ 1.6
	20	S.	+ 2.9
	21	E.	+ 2.1
	27	S.	+ 1.4
Nov.	13	F.	+ 4.1
Mean			+ 2.24
Div., Flex., etc.			+ 0.05

α LYRÆ.

	h.	m.	s.
Right Ascension,	18	32	46
North-Polar Dist.,	51°	19′	47″.08

1877.			″
Jan.	23	E.	0.0
	24	F.	+ 3.7
	25	S.	+ 0.2
	26	P.	− 0.9
	28	F.	− 2.9
	29	S.	+ 0.1
	30	E.	+ 1.1
Feb.	5	F.	− 0.9
	6	S.	− 1.8
	7	P.	− 0.6
	12	E.	− 1.4
	15	P.	+ 0.1
May	15	P.	− 0.2
	31	P.	+ 0.4
June	23	S.	+ 0.2
	25	P.	+ 0.5
	29	F.	+ 0.9
July	6	P.	− 0.2
	8	F.	+ 0.4
	14	P.	− 0.4
	16	F.	− 1.2
	26	P.	+ 0.6
	30	P.	− 0.1
Aug.	11	E.	+ 0.1
	17	S.	0.0
	20	S.	+ 1.0
	21	E.	− 0.2
	27	S.	− 0.3
Nov.	12	E.	+ 0.4
	13	F.	+ 1.0
	19	P.	+ 1.0
	20	E.	+ 0.6
Dec.	3	P.	− 0.3
	8	F.	− 0.8
	14	E.	− 0.1
	15	F.	− 2.2
	18	E.	− 1.1
Mean			− 0.09
Div., Flex., etc.			− 0.17

β LYRÆ.

	h.	m.	s.
Right Ascension,	18	45	32
North-Polar Dist.,	56°	46′	44″.37

1877.			″
Jan.	23	E.	0.0
	24	F.	+ 2.3
	25	S.	− 0.7
	26	P.	− 1.1
	28	F.	− 0.8
	29	S.	+ 0.2
Feb.	7	P.	− 1.2
	9	F.	− 2.0
	12	E.	− 1.3
	15	P.	+ 0.6
June	14	F.	+ 0.8
	23	S.	+ 1.0
July	14	P.	+ 0.4
	30	P.	+ 1.2
Aug.	20	S.	+ 0.4
	21	E.	+ 0.9
	27	S.	+ 1.1
	30	E.	+ 0.1
Nov.	12	E.	+ 0.5
	19	P.	− 0.8
	20	E.	+ 0.8
Dec.	8	F.	− 0.1
	15	F.	+ 0.2
Mean			+ 0.11
Div., Flex., etc.			+ 0.15

50 DRACONIS.

	h.	m.	s.
Right Ascension,	18	50	20
North-Polar Dist.,	14°	42′	44″.65

1877.			″
June	14	F.	+ 0.3
Div., Flex., etc.			− 1.13

50 DRACONIS, S. P.

	h.	m.	s.
Right Ascension,	18	50	20
North-Polar Dist.,	345°	17′	15″.35

1877.			″
Feb.	9	E.	+ 4.0
Div., Flex., etc.			− 1.22

ζ AQUILÆ.

	h.	m.	s.
Right Ascension,	18	59	45
North-Polar Dist.,	76°	19′	3″.70

1877.			″
Jan.	26	P.	+ 1.8
	28	F.	+ 0.8
	29	S.	+ 2.1
Feb.	5	F.	+ 2.0
	7	P.	+ 0.9
	12	E.	− 1.3
	15	P.	+ 2.4
May	31	P.	+ 1.9
June	14	F.	+ 0.8
	22	F.	+ 1.8
	25	P.	+ 2.4
July	8	F.	+ 2.5
Aug.	9	F.	+ 2.5
	17	S.	+ 5.4
	18	F.	+ 1.6
	27	S.	+ 3.4
	30	E.	+ 1.5
Nov.	20	E.	+ 2.7
Dec.	8	F.	+ 2.0
	15	F.	+ 1.6
Mean			+ 1.94
Div., Flex., etc.			− 0.16

ζ AQUILÆ (Ref.).

1877.			″
May	31	P.	+ 2.2
June	22	F.	− 0.2
Mean			+ 1.00
Div., Flex., etc.			+ 0.35

d SAGITTARII.

	h.	m.	s.
Right Ascension,	19	10	26
North-Polar Dist.,	109°	10′	8″.39

1877.			″
May	18	S.	+ 4.4
June	23	S.	+ 4.2
July	16	F.	+ 4.2
Aug.	9	F.	+ 2.0
	11	E.	+ 5.4
	18	F.	+ 5.2
	27	S.	+ 5.6
	30	E.	+ 5.0
Oct.	12	F.	+ 4.8
	13	S.	+ 7.2
Mean			+ 4.80
Div.. Flex., etc.			+ 0.12

δ DRACONIS.

	h.	m.	s.
Right Ascension,	19	12	31
North-Polar Dist.,	22°	33′	18″.01

1877.			″
Jan.	24	F.	+ 2.2
	28	F.	+ 0.3
Feb.	7	P.	0.0
	9	F.	− 3.0
	15	P.	+ 0.7
June	14	F.	+ 2.6
	22	F.	+ 1.0
Dec.	18	E.	− 0.7
Mean			+ 0.39
Div., Flex., etc.			− 1.02

δ DRACONIS (Ref.).

1877.			″
Feb.	15	P.	− 2.3
June	14	F.	− 1.1
	22	F.	− 1.7
Mean			− 1.70
Div., Flex., etc.			+ 1.61

δ DRACONIS, S. P.

	h.	m.	s.
Right Ascension,	19	12	31
North-Polar Dist.,	337°	26′	41″.99

1877.			″
Dec.	3	P.	+ 0.1
Div., Flex., etc.			− 1.06

τ DRACONIS.

	h.	m.	s.
Right Ascension,	19	17	55
North-Polar Dist ,	16°	52′	25″.06

1877.			″
Feb.	7	P.	− 0.4
July	7	E.	+ 1.8
Mean			+ 0.70
Div., Flex., etc.			− 1.18

τ DRACONIS (Ref.).

1877.			″
July	7	E.	− 2.2
Div., Flex., etc.			+ 1.36

δ AQUILÆ.

	h.	m.	s.
Right Ascension,	19	19	18
North-Polar Dist.,	87°	7′	43″.26

1877.			″
Jan.	28	F.	− 0.6
Feb.	20	E.	+ 1.1
May	31	P.	+ 1.5
July	16	F.	+ 1.9
Aug.	9	F.	+ 0.6
	18	F.	+ 1.3
	27	S.	+ 2.4
	28	E.	+ 2.0
	30	E.	+ 2.1
Oct.	12	F.	+ 2.6
Dec.	3	P.	+ 1.8
	14	E.	+ 1.6
	18	E.	+ 2.1
Mean			+ 1.57
Div., Flex., etc.			+ 0.14

κ AQUILÆ.

	h. m. s.
Right Ascension,	19 30 16
North-Polar Dist.,	97° 17′ 55″.73

1877.				″
July	7	E.	+	3.6
Aug.	11	E.	+	3.1
	18	F.	+	1.0
	28	E.	+	3.3
Sept.	1	F.	+	3.0
Oct.	12	F.	+	2.3
	13	S.	+	5.4
Mean			+	3.10
Div., Flex., etc. . . .			+	0.10

γ AQUILÆ.

	h. m. s.
Right Ascension,	19 40 25
North-Polar Dist.,	79° 41′ 5″.93

1877.				″
Jan.	28	F.	+	0.4
Feb.	6	S.	+	1.8
	9	F.	−	0.7
	14	S.	+	1.3
	16	E.	+	1.9
	20	E.	+	1.9
	28	E.	−	0.8
Mar.	2	S.	+	1.4
May	2	S.	+	0.8
	31	P.	+	1.2
June	22	F.	+	0.9
July	7	E.	+	1.4
	12	F.	+	1.9
	13	S.	+	4.2
	14	P.	+	0.5
Aug.	11	E.	+	1.6
	28	E.	+	2.6
	30	E.	+	1.2
Sept.	3	F.	+	1.2
	18	F.	+	0.8
	22	F.	+	1.3
Oct.	1	F.	+	2.2
	5	S.	+	0.8
	12	F.	+	1.4
	13	S.	+	4.9
Dec.	3	P.	+	2.7
	14	E.	+	0.1
	18	E.	+	1.3
Mean			+	1.44
Div., Flex., etc. . . .			−	0.21

γ AQUILÆ (Ref.).

1877.				″
July	12	F.	+	0.7
Div., Flex., etc. . . .			+	0.41

α AQUILÆ.

	h. m. s.
Right Ascension,	19 44 47
North-Polar Dist.,	81° 27′ 18″.07

1877.				″
Jan.	24	F.	+	2.0
	28	F.	+	0.5
Feb.	5	F.	−	0.1
	6	S.	+	0.5
	9	F.	−	0.8
	14	S.	+	1.7
	16	E.	+	0.7
	20	E.	+	0.4
	28	E.	+	0.3
Mar.	2	S.	+	0.9
	31	P.	+	0.2
June	22	F.	−	0.6

α AQUILÆ—Continued.

1877.				″
July	7	E.	+	1.1
	14	P.	−	0.6
Aug.	11	E.	+	1.1
	18	F.	+	0.5
Sept.	3	F.	+	1.9
Dec.	3	P.	+	1.1
	8	F.	+	1.2
	15	F.	−	0.3
	18	E.	+	1.4
Mean			+	0.62
Div., Flex., etc. . . .			−	0.13

α AQUILÆ (Ref.).

1877.				″
Dec.	3	P.		0.0
Div., Flex.. etc. . . .			+	0.48

λ URSÆ MINORIS.

	h. m. s.
Right Ascension,	19 47 16
North-Polar Dist,	1° 3′ 50″.85

1877.				″
May	31	P.	+	1.4
July	6	P.	+	0.7
	14	P.	−	0.4
	26	P.	+	0.6
	30	P.	+	0.1
Aug.	28	E.	+	1.0
Sept.	3	F.	−	0.6
	26	P.	+	0.6
Oct.	5	F.	+	0.7
	12	F.	+	2.2
	13	S.	+	3.4
Mean			+	0.88
Div., Flex., etc. . . .			−	1.02

λ URSÆ MINORIS, S.P.

	h. m. s.
Right Ascension,	19 47 16
North-Polar Dist.,	358° 56′ 9″.15

1877.				″
Jan.	27	P.	+	1.7
Feb.	6	F.	+	2.3
	8	P.	+	1.7
	10	F.	+	1.4
	15	S.	+	0.9
	25	E.	+	2.1
Mar.	9	E.	+	3.3
	15	P.	+	2.9
Dec.	3	P.	+	1.0
Mean			+	1.92
Div., Flex., etc. . . .			−	1.01

ε DRACONIS.

	h. m. s.
Right Ascension,	19 48 35
North-Polar Dist.,	20° 2′ 44″.73

1877.				″
Feb.	15	P.	−	0.2
Div., Flex., etc. . . .			−	1.14

β AQUILÆ.

	h. m. s.
Right Ascension,	19 49 16
North-Polar Dist.,	83° 53′ 56″.05

1877.				″
Feb.	7	P.	+	1.1
June	22	F.	−	0.4

β AQUILÆ—Continued.

1877.				″
Dec.	3	P.	+	2.1
	8	F.	+	2.1
Mean			+	1.22
Div., Flex., etc. . . .			+	0.07

τ AQUILÆ.

	h. m. s.
Right Ascension,	19 58 8
North Polar Dist.,	83° 4′ 3″.30

1877.				″
July	8	F.	+	0.9
	14	P.	+	1.0
	18	F.	+	0.9
	22	F.	+	1.4
	26	P.	+	0.4
Oct.	1	F.	+	0.8
	12	F.	+	1.9
Mean			+	1.04
Div., Flex., etc. . . .			+	0.01

α^2 CAPRICORNI.

	h. m. s.
Right Ascension,	20 11 13
North-Polar Dist.,	102° 55′ 27″.96

1877.				″
July	8	F.	+	1.5
	14	P.	−	0.3
Aug.	21	E.	+	1.7
	27	S.	+	2.0
Sept.	3	F.	+	0.6
	18	F.	+	0.4
	22	F.	+	1.8
	26	P.	+	0.3
Oct.	10	S.	+	1.2
	12	F.	+	1.1
Dec.	14	E.	+	1.7
Mean			+	1.10
Div., Flex., etc. . . .			+	0.16

κ CEPHEI.

	h. m. s.
Right Ascension,	20 13 0
North-Polar Dist.,	12° 39′ 36″.86

1877.				″
June	29	F.	+	0.1
Div., Flex., etc. . . .			−	1.10

κ CEPHEI (Ref.).

1877.				″
June	29	F.	−	2.3
Div., Flex., etc. . . .			+	1.35

κ CEPHEI, S. P.

	h. m. s.
Right Ascension,	20 13 0
North-Polar Dist.,	347° 20′ 23″.14

1877.				″
Jan.	27	P.	+	2.8
Mar.	15	P.	+	3.2
Mean			+	3.00
Div., Flex., etc. . . .			−	1.26

π CAPRICORNI.

	h. m. s.
Right Ascension,	20 20 17
North-Polar Dist.,	108° 36′ 47″.45

1877.				″
June	29	F.	+	2.6
July	8	F.	+	2.0
Aug.	11	E.	+	2.5
	21	E.	+	1.7
	27	S.	+	1.9
Sept.	22	F.	+	2.4
	26	P.	+	0.7
Oct.	10	S.	+	1.8
Mean			+	1.95
Div., Flex., etc. . . .			+	0.10

ε DELPHINI.

	h. m. s.
Right Ascension,	20 27 20
North-Polar Dist.,	79° 6′ 48″.40

1877.				″
April	6	E.	+	3.2
May	3	P.	+	1.7
June	29	F.	+	1.8
July	26	P.	+	1.2
	30	P.	+	1.5
Aug.	9	F.	+	1.4
	11	E.	+	1.9
	21	E.	+	2.3
	27	S.	+	2.2
Sept.	3	F.	+	2.6
	26	P.	+	0.5
Dec.	9	P.	+	1.5
Mean			+	1.82
Div., Flex., etc. . . .			−	0.22

ε DELPHINI (Ref.).

1877.				″
June	29	F.	+	1.5
July	26	P.	+	0.9
	30	P.	+	1.2
Mean			+	1.20
Div., Flex., etc. . . .			+	0.39

GROOMBRIDGE 3241.

	h. m. s.
Right Ascension,	20 30 31
North-Polar Dist.,	17° 53′ 6″.23

1877.				″
July	12	F.	+	1.5
Div., Flex., etc. . . .			−	1.19

GROOMBRIDGE 3241, S. P.

	h. m. s.
Right Ascension,	20 30 31
North-Polar Dist.,	342° 6′ 53″.77

1877.				″
Feb.	9	E.	+	0.4
Mar.	15	P.	+	1.8
Mean			+	1.10
Div., Flex., etc. . . .			−	1.21

α CYGNI.

	h.	m.	s.
Right Ascension,	20	37	14
	°	′	″
North-Polar Dist.,	45	9	30.43

1877.			″
Feb.	7	P.	+ 0.8
	8	E.	+ 0.7
	16	E.	+ 0.9
	20	E.	+ 0.9
	28	E.	+ 1.1
April	6	E.	+ 2.7
May	3	P.	+ 1.6
	6	S.	+ 1.8
	31	P.	+ 0.6
July	6	P.	+ 0.6
	12	F.	+ 1.1
	14	P.	+ 0.5
	30	P.	+ 1.0
Aug.	11	E.	+ 1.1
	18	F.	+ 0.5
	21	E.	+ 1.9
	27	S.	+ 1.1
	30	E.	+ 1.7
Sept.	3	F.	+ 0.9
	18	F.	+ 1.4
	22	F.	+ 0.9
	26	P.	+ 1.0
Oct.	1	F.	+ 1.0
	14	P.	+ 0.4
Dec.	8	F.	+ 1.2
	9	P.	+ 0.8
	15	F.	− 0.5
	18	E.	+ 1.0
Mean			+ 1.02
Div., Flex., etc.			− 0.76

α CYGNI (Ref.).

1877.			″
Feb.	7	P.	− 0.6
	20	E.	− 0.1
July	12	F.	− 0.5
Dec.	18	E.	− 1.2
Mean			− 0.60
Div., Flex., etc.			+ 1.03

μ AQUARII.

	h.	m.	s.
Right Ascension,	20	46	1
	°	′	″
North-Polar Dist.,	99	26	35.55

1877.			″
May	3	P.	+ 1.2
July	6	P.	+ 1.9
	14	P.	+ 0.6
Aug.	9	F.	+ 1.1
	17	S.	+ 2.0
	21	E.	+ 1.3
	27	S.	+ 2 3
	30	E.	+ 2.1
Sept.	18	F.	+ 0.9
	21	F.	+ 1.8
	24	F.	− 0.6
	26	P.	+ 1.5
Oct.	2	P.	+ 0.7
	5	S.	− 0.7
	6	F	+ 1.5
	14	P.	+ 0.5
Mean			+ 1.13
Div., Flex., etc.			+ 0.07

ν CYGNI.

	h.	m.	s,
Right Ascension,	20	52	35
	°	′	″
North-Polar Dist.,	49	18	18.72

1877.			″
May	3	P.	+ 2.5
July	6	P.	+ 2.5
	12	F.	+ 4.4
	14	P.	+ 1.8
Aug.	27	S.	+ 3.4
	30	E.	+ 2.5
Sept.	3	F.	+ 1.7
	18	F.	+ 3.0
	21	F.	+ 3.2
	22	F.	+ 3.8
	24	F.	+ 1.6
Oct.	1	F.	+ 2.6
	2	P.	+ 1.7
	5	S.	+ 1.1
	12	F.	+ 2.8
	13	S.	+ 1.2
	16	F.	+ 2.6
Nov.	11	P.	+ 1.3
Dec.	8	F.	+ 2.1
	9	P.	+ 2.3
	15	F.	+ 0.4
Mean			+ 2.31
Div., Flex., etc.			− 0.36

12-YEAR CAT., 1879.

	h.	m.	s.
Right Ascension,	20	53	7
	°	′	″
North-Polar Dist.,	9	54	37.08

1877.			″
Oct.	14	P.	− 0.8
Div., Flex., etc.			− 1.15

12-YEAR CAT., 1879, S. P.

	h.	m.	s.
Right Ascension,	20	53	7
	°	′	″
North-Polar Dist.,	350	5	22.92

1877.			″
Jan.	27	P.	+ 2.6
Feb.	25	E.	+ 2.3
Mar.	15	P.	+ 2.2
	23	S.	+ 3.1
Mean			+ 2.55
Div., Flex., etc.			− 1.30

61^1 CYGNI.

	h.	m.	s.
Right Ascension,	21	1	23
	°	′	″
North-Polar Dist.,	51	51	15.72

1877.			″
May	3	P.	+ 1.3
July	6	P.	+ 1.2
	12	F.	+ 0.9
Aug.	27	S.	+ 0.3
	30	E.	+ 0.5
Sept.	1	F.	+ 0.5
	3	F.	+ 1.1
	18	F.	− 0.4
	21	F.	+ 2.4
	22	F.	+ 1.7
Oct.	1	F.	− 0.1
	2	P.	− 0.1
	6	F.	+ 0.7
	11	E.	− 1.0
	12	F.	+ 1.8
	22	F.	+ 1.6
Nov.	11	P.	+ 0.7
	12	E.	+ 1.0
Dec.	9	P.	+ 1.4
Mean			+ 0.82
Div., Flex., etc.			− 0.10

ζ CYGNI.

	h.	m.	s.
Right Ascension,	21	7	42
	°	′	″
North-Polar Dist.,	60	16	35.83

1877.			″
Feb.	27	P.	− 0.2
Mar.	5	S.	+ 0.3
April	6	E.	+ 2.0
May	3	P.	+ 1.7
	6	S.	+ 1.2
July	12	F.	+ 1.2
	14	P.	+ 0.6
	26	P.	+ 1.1
	30	P.	+ 1.4
Aug.	9	F.	+ 0.9
	18	F.	+ 0.1
	20	S.	+ 1.5
	30	E.	+ 0.8
Sept.	3	F.	+ 1.6
	21	F.	+ 1.4
	22	F.	+ 2.3
	24	F.	+ 0.6
	26	P.	+ 0.8
Oct.	2	P.	+ 0.5
	11	E.	− 1.0
	12	F.	+ 1.6
	14	P.	+ 0.5
	15	E.	+ 0.8
Nov.	11	P.	+ 0.1
	12	E.	− 0.4
Dec.	9	P.	+ 0.6
	15	F.	− 1.3
Mean			+ 0.77
Div., Flex., etc.			+ 0.11

ζ CYGNI (Ref.).

1877.			″
May	3	P.	+ 0.9
July	26	P.	− 0.2
Mean			+ 0.35
Div., Flex., etc.			+ 0.26

α CEPHEI.

	h.	m.	s.
Right Ascension,	21	15	39
	°	′	″
North-Polar Dist.,	27	56	8.22

1877.			″
Jan.	31	E.	− 1.4
Feb.	7	P.	− 0.4
	27	P.	− 0.6
May	3	P.	− 0.5
July	6	P.	− 0.7
	26	P.	− 0.6
Aug.	9	F.	− 0.4
	18	F.	− 0.6
Sept.	1	F.	− 0.1
	3	F.	− 0.8
	16	F.	− 1.7
Mean			− 0.71
Div., Flex., etc.			− 0.93

α CEPHEI (Ref.).

1877.			″
Feb.	7	P.	− 3.5
	27	P.	− 3.0
May	3	P.	− 3.1
July	6	P.	− 2.3
	26	P.	− 2.9
Mean			− 2.96
Div., Flex., etc.			+ 1.54

α CEPHEI, S. P.

	h.	m.	s.
Right Ascension,	21	15	39
	°	′	″
North-Polar Dist.,	332	3	51.78

1877.			″
Feb.	28	P.	+ 0.6
Mar.	15	P.	+ 1.7
Mean			+ 1.15
Div., Flex., etc.			− 0.83

ι PEGASI.

	h.	m.	s.
Right Ascension,	21	16	24
	°	′	″
North-Polar Dist.,	70	43	13.53

1877.			″
Aug.	20	S.	+ 3.8
	30	E.	+ 2.3
Sept.	21	F.	+ 2.9
	24	F.	+ 0.5
Oct.	2	P.	+ 1.9
	6	F.	+ 2.3
	11	E.	+ 1.0
	12	F.	+ 3.2
	14	P.	+ 2.1
	15	E.	+ 2.3
	16	F.	+ 2.2
	22	F.	+ 3.1
Nov.	11	P.	+ 2.0
	12	E.	+ 1.8
Mean			+ 2.24
Div., Flex., etc.			− 0.16

ι PEGASI (Ref.).

1877.			″
Oct.	2	P.	+ 2.4
Div., Flex., etc.			+ 0.34

β AQUARII.

	h.	m.	s.
Right Ascension,	21	25	5
	°	′	″
North-Polar Dist.,	96	6	39.39

1877.			″
Jan.	26	S.	+ 2.3
May	3	P.	+ 1.9
	6	S.	+ 2.3
July	26	P.	+ 2.1
Aug.	17	S.	+ 2.4
	18	F.	+ 1.3
	20	S.	+ 3.0
	21	E.	+ 1.3
	24	F.	+ 1.0
Oct.	6	F.	+ 2.3
	15	E.	+ 1.8
	22	F.	+ 1.5
	23	E.	+ 2.2
Nov.	12	E.	+ 1.8
Mean			+ 1.94
Div., Flex., etc.			+ 0.17

β CEPHEI.

	h. m. s.
Right Ascension,	21 27 4
North-Polar Dist.,	19° 58′ 45″.94

1877.			″
Feb.	28	E.	− 0.1
May	3	P.	− 0.2
Sept.	24	F.	− 1.0
Oct.	2	P.	− 0.8
	6	F	− 0.4
Mean			− 0.50
Div., Flex., etc.			− 1.14

β CEPHEI (Ref).

1877.			″
Oct.	2	P.	− 3.0
Div., Flex., etc.			+ 1.49

β CEPHEI, S. P.

	h. m. s.
Right Ascension,	21 27 4
North-Polar Dist.,	340° 1′ 14″.06

1877.			″
April	25	P.	+ 3.8
Div., Flex., etc.			− 1.15

ξ AQUARII.

	h. m. s.
Right Ascension,	21 31 12
North-Polar Dist.,	98° 24′ 16″.56

1877.			″
July	26	P.	+ 1.5
Aug.	17	S.	+ 2.0
	18	F.	+ 1.3
	20	S.	+ 2.7
	21	E.	+ 1.4
	28	E.	+ 1.4
Sept.	1	F.	+ 0.2
	21	F.	+ 1.7
	24	F.	+ 0.6
Oct.	11	E.	0.0
	12	F.	− 1.6
	15	E.	+ 2.0
	22	F.	0.0
Mean			+ 1.02
Div., Flex., etc.			+ 0.05

ξ AQUARII (Ref.).

1877.			″
Aug.	28	E.	+ 1.9
Div., Flex., etc.			+ 0.31

ε PEGASI.

	h. m. s.
Right Ascension,	21 38 9
North-Polar Dist.,	80° 41′ 16″.29

1877.			″
Jan.	26	S.	+ 4.3
	30	S.	+ 3.8
Feb.	27	P.	+ 2.1
	28	E.	+ 1.2
Mar.	5	S.	+ 1.4
	14	P.	+ 1.8
May	6	S.	+ 3.0
July	26	P.	+ 2.0
Aug.	9	F.	+ 0.5
	17	S.	+ 3.3

ε PEGASI—Continued.

1877.			″
Aug.	18	F.	+ 1.2
	20	S.	+ 3.0
	21	E.	+ 2.6
Sept.	24	F.	+ 1.3
Oct.	5	S.	+ 2.7
	6	F.	+ 2.2
	11	E.	+ 0.0
	15	E.	+ 2.3
	22	F.	+ 1.4
	23	E.	+ 3.0
	31	E.	+ 2.1
Nov.	11	P.	+ 1.1
	16	E.	+ 1.5
	20	E.	+ 1.7
Mean			+ 2.06
Div., Flex., etc.			− 0.18

11 CEPHEI.

	h. m. s.
Right Ascension,	21 40 7
North-Polar Dist.,	19° 15′ 17″.95

1877.			″
Oct.	11	E.	− 1.7
Div., Flex., etc.			− 1.17

μ CAPRICORNI.

	h. m. s.
Right Ascension,	21 46 35
North-Polar Dist.,	104° 7′ 45″.57

1877.			″
June	29	F.	+ 2.7
July	26	P.	+ 2.3
Aug.	17	S.	+ 2.1
	18	F.	− 0.6
	21	E.	+ 2.3
Sept.	1	F.	+ 3.8
	18	F.	+ 1.0
	24	F.	+ 2.0
Oct.	5	S.	+ 2.4
	13	S.	+ 1.0
	15	E.	+ 2.1
	18	P.	+ 3.6
	31	E.	+ 2.6
Nov.	16	E.	+ 2.4
Mean			+ 2.12
Div., Flex., etc.			+ 0.15

79 DRACONIS.

	h. m. s.
Right Ascension,	21 51 20
North-Polar Dist.,	16° 52′ 46″.85

1877.			″
June	29	F.	+ 2.6
Aug.	17	S.	+ 0.1
Oct.	6	F.	+ 1.8
Mean			+ 1.50
Div., Flex., etc.			− 1.18

79 DRACONIS, S. P.

	h. m. s.
Right Ascension,	21 51 20
North-Polar Dist.,	343° 7′ 13″.15

1877.			″
Jan.	27	P.	+ 2.7
Mar.	15	P.	+ 1.2

79 DRACONIS, S. P.—Continued.

1877.			″
April	5	P.	+ 3.6
	14	E.	+ 3.6
	23	F.	+ 4.6
Mean			+ 3.14
Div., Flex., etc.			− 1.24

α AQUARII.

	h. m. s.
Right Ascension,	21 59 28
North-Polar Dist.,	90° 54′ 59″.32

1877.			″
Jan.	26	S.	+ 2.5
	30	S.	+ 2.4
Mar.	5	S.	+ 0.2
	14	P.	+ 1.7
	19	F.	− 2.6
April	5	E.	+ 2.5
May	6	S.	+ 2.0
June	29	F.	+ 1.2
July	26	P.	+ 1.4
Aug.	17	S.	+ 1.6
	18	F.	+ 1.4
Sept.	1	F.	+ 2.5
	3	F.	+ 1.0
	15	F.	0.0
	18	F.	+ 1.7
	24	F.	+ 0.5
Oct.	1	F.	+ 1.1
	12	F.	+ 1.2
	13	S.	+ 0.4
	16	F.	+ 1.0
	18	P.	+ 1.6
	22	F.	+ 1.0
	23	E.	+ 2.0
	24	P.	+ 1.4
	31	E.	+ 1.0
Nov.	16	E.	+ 0.4
	20	E.	− 1.7
Mean			+ 1.09
Div., Flex., etc.			+ 0.16

θ AQUARII.

	h. m. s.
Right Ascension,	22 10 21
North-Polar Dist.,	98° 23′ 41″.49

1877.			″
Sept.	21	F.	+ 0.7
	22	F.	+ 1.2
	24	F.	− 0.3
	26	P.	+ 1.0
Oct.	6	F.	+ 0.4
	13	S.	+ 0.5
	14	P.	+ 0.3
	22	F.	− 0.6
	24	P.	+ 1.2
Nov.	13	F.	+ 2.0
	20	E.	+ 0.9
Mean			+ 0.66
Div., Flex., etc.			+ 0.05

θ AQUARII (Ref.).

1877.			″
Sept.	26	P.	+ 1.4
Oct.	14	P.	+ 0.6
Mean			+ 1.00
Div., Flex., etc.			+ 0.31

π AQUARII.

	h. m. s.
Right Ascension.	22 19 0
North-Polar Dist.,	89° 14′ 45″.62

1877.			″
July	29	S.	+ 1.7
Sept.	1	F.	+ 0.4
	15	F.	+ 1.0
Oct.	24	P.	+ 1.0
Nov.	7	F.	+ 1.2
Dec.	10	E.	+ 1.3
Mean			+ 1.10
Div., Flex., etc.			+ 0.16

η AQUARII.

	h. m. s.
Right Ascension,	22 29 2
North-Polar Dist.,	90° 45′ 2″.63

1877.			″
Sept.	15	F.	+ 0.9
	22	F.	+ 1.2
	24	F.	+ 0.7
Oct.	24	P.	+ 1.4
Nov.	7	F.	+ 1.8
Dec.	10	E.	+ 0.5
Mean			+ 1.08
Div., Flex., etc.			+ 0.16

226 CEPHEI.

	h. m. s.
Right Ascension.	22 30 7
North-Polar Dist.,	14° 24′ 27″.06

1877.			″
Dec.	9	P.	− 0.1
Div., Flex., etc.			− 1.13

226 CEPHEI (Ref.).

1877.			″
Dec.	9	P.	− 1.8
Div., Flex., etc.			+ 1.34

226 CEPHEI, S. P.

	h. m. s.
Right Ascension,	22 30 7
North-Polar Dist.,	345° 35′ 32″.94

1877.			″
Jan.	27	P.	+ 2.5
Feb.	27	S.	+ 3.0
	28	P.	+ 1.5
April	20	S.	+ 3.9
Mean			+ 2.72
Div., Flex., etc.			− 1.22

ζ PEGASI.

	h. m. s.
Right Ascension,	22 35 20
North-Polar Dist.,	79° 48′ 3

1877.			
Jan.	26		
	29		
	30		
Feb.	1		
April			
May			
July			

ζ Pegasi—Continued.

1877.			″
Aug. 6	S.	+	3.9
18	F.	−	0.1
Oct. 18	P.	+	2.7
Nov. 7	F.	+	1.6
Dec. 9	P.	+	1.4
10	E.	+	2.0
Mean		+	2.01
Div., Flex., etc.		−	0.20

ι Cephei.

	h.	m.	s.
Right Ascension,	22	45	18
North-Polar Dist.,	24°	26′	46″.96

1877.			″
Jan. 26	S.	+	0.3
Feb. 8	P.	+	0.2
April 11	S.	−	1.2
Mean		−	0.23
Div., Flex., etc.		−	0.98

ι Cephei, S. P.

	h.	m.	s.
Right Ascension,	22	45	18
North-Polar Dist.,	335°	33′	13″.04

1877.			″
Jan. 27	P.	+	1.3
Mar. 7	S.	+	1.1
15	P.	−	1.7
April 12	S.	+	3.4
Mean		+	1.02
Div., Flex., etc.		−	0.95

λ Aquarii.

	h.	m.	s.
Right Ascension,	22	46	12
North-Polar Dist.,	98°	13′	59″.95

1877.			″
Sept. 21	F.	+	1.0
22	F.	+	1.4
Oct. 24	P.	+	2.6
Nov. 13	F.	+	1.9
17	F.	+	3.2
Dec. 3	P.	+	2.9
9	P.	+	0.3
10	E.	+	1.8
Mean		+	1.89
Div., Flex., etc.		+	0.05

λ Aquarii (Ref.).

1877.			″
Dec. 9	P.	+	0.9
Div., Flex., etc.		+	0.31

α Piscis Australis.

	h.	m.	s.
Right Ascension,	22	50	51
North-Polar Dist.,	120°	16′	24″.23

α Piscis Australis—Continued.

1877.			″
Jan. 24	E.	+	2.4
27	P.	+	2.1
Feb. 15	S.	+	1.9
April 11	S.	−	1.3
May 6	S.	+	0.9
Oct. 24	P.	+	1.6
Dec. 3	P.	+	3.0
9	P.	+	0.6
10	E.	+	2.1
Mean		+	1.48
Div., Flex., etc.		+	0.41

α Pegasi.

	h.	m.	s.
Right Ascension,	22	58	38
North-Polar Dist.,	75°	27′	21″.07

1877.			″
Jan. 24	E.	+	2.3
Feb. 7	S.	+	4.9
9	E.	+	3.9
10	F.	+	2.4
15	S.	+	2.2
April 5	E.	+	3.4
11	S.	+	1.7
May 6	S.	+	2.3
Sept. 1	F.	+	2.4
3	F.	+	1.5
21	F.	+	1.5
22	F.	+	2.2
Oct. 6	F.	+	1.5
24	P.	+	2.8
Nov. 3	F.	+	1.0
Dec. 14	E.	+	2.3
Mean		+	2.39
Div., Flex., etc.		−	0.17

ο Cephei.

	h.	m.	s.
Right Ascension,	23	13	35
North-Polar Dist.,	22°	33′	42″.10

1877.			″
Oct. 11	E.	−	1.5
Nov. 16	E.	+	0.1
19	P.	−	1.1
Mean		−	0.83
Div., Flex., etc.		−	1.02

ο Cephei (Ref.).

1877.			″
Nov. 16	E.	−	1.3
Div., Flex., etc.		+	1.61

ο Cephei, S. P.

	h.	m.	s.
Right Ascension,	23	13	35
North-Polar Dist.,	337°	26′	17″.90

1877.			″
April 5	P.	+	2.4
Div., Flex., etc.		−	1.06

θ Piscium.

	h.	m.	s.
Right Ascension,	23	21	44
North-Polar Dist.,	84°	17′	45″.83

1877.			″
Sept. 21	F.	+	0.4
22	F.	+	2.7
Oct. 11	E.	+	2.1
13	S.	+	0.7
14	P.	+	1.5
24	P.	+	2.0
Nov. 2	S.	+	1.7
19	P.	+	1.0
Dec. 9	P.	+	1.1
14	E.	+	1.0
Mean		+	1.42
Div., Flex., etc.		+	0.09

ι Piscium.

	h.	m.	s.
Right Ascension,	23	33	37
North-Polar Dist.,	85°	2′	24″.15

1877.			″
Feb. 8	P.	+	3.9
April 10	F.	+	2.6
July 21	F.	−	0.7
Sept. 22	F.	+	2.0
Oct. 11	E.	−	0.8
12	F.	−	1.4
13	S.	+	0.1
18	P.	+	1.3
Nov. 12	E.	+	0.2
16	E.		0.0
17	F.	+	2.6
19	P.	+	0.4
Dec. 6	E.	+	1.1
8	F.	+	0.4
9	P.	+	0.6
14	E.	+	0.8
15	F.	+	2.3
Mean		+	0.91
Div., Flex., etc.		+	0.10

ι Piscium (Ref.).

1877.			″
Nov. 12	E.	−	0.2
16	E.	+	1.3
Mean		+	0.55
Div., Flex., etc.		+	0.56

γ Cephei.

	h.	m.	s.
Right Ascension,	23	34	19
North-Polar Dist.,	13°	3′	14″.70

1877.			″
Oct. 14	P.	+	1.1
Div., Flex., etc.		−	1.10

γ Cephei (Ref.).

1877.			″
Oct. 14	P.	−	1.7
Div., Flex., etc.		+	1.35

γ Cephei, S. P.

	h.	m.	s.
Right Ascension,	23	34	19
North-Polar Dist.,	346°	56′	45″.30

1877.			″
Jan. 27	P.	−	0.3
April 5	P.	+	0.8
25	P.	+	2.0
Mean		+	0.83
Div., Flex., etc.		−	1.25

Groombridge 4163.

	h.	m.	s.
Right Ascension,	23	48	52
North-Polar Dist.,	16°	16′	27″.72

1877.			″
Nov. 19	P.	−	0.5
Div., Flex., etc.		−	1.17

Groombridge 4163, S. P.

	h.	m.	s.
Right Ascension,	23	48	52
North-Polar Dist.,	343°	43′	32″.28

1877.			″
Mar. 15	P.	+	1.9
April 5	P.	+	2.0
Mean		+	1.95
Div., Flex., etc.		−	1.24

ω Piscium.

	h.	m.	s.
Right Ascension,	23	53	0
North-Polar Dist.,	83°	49′	2″.78

1877.			″
Feb. 8	P.	+	1.9
Aug. 21	E.	−	0.1
28	E.	+	1.9
Oct. 1	F.	+	0.2
11	E.	−	0.9
13	S.	+	0.3
14	P.	+	0.1
15	E.	+	0.3
Nov. 2	S.	+	1.1
13	F.	+	0.3
19	P.	−	0.5
Dec. 6	E.	+	1.2
8	F.	+	0.6
15	F.	+	1.8
Mean		+	0.59
Div., Flex., etc.		+	0.06

MEAN PLACES

OF

MISCELLANEOUS STARS,

GIVEN BY

INDIVIDUAL OBSERVATIONS

WITH THE

TRANSIT CIRCLE.

1877.

MEAN PLACES OF MISCELLANEOUS STARS FOR 1877.0,

GIVEN BY

INDIVIDUAL OBSERVATIONS

WITH

THE TRANSIT CIRCLE.

B. A. C. 5.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 2 24.99	92 54 26.6
Dec. 15 (8) F.	24.96	27.2
Mean . . .	0 2 24.98	92 54 26.90
Div., Flex., etc.	. .	+ 0.26

LAMONT 18.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 6 21.94	91 54 41.9
Dec. 15 F.	21.86	42.0
Mean . . .	0 6 21.90	91 54 41.95
Div.. Flex., etc.	. .	+ 0.20

WEISSE (2) 296.

1877.	h. m. s.	° ′ ″
Sept. 26 (6.5) P.	0 12 13.00	59 9 57.9
Dec. 15 F.	12.95	57.4
Mean . . .	0 12 12.98	59 9 57.65
Div., Flex., etc.	. .	+ 0.08

B. A. C. 69.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 14 46.95	129 55 19.8
Nov. 17 F.	46.99	18.5
Dec. 11 F.	46.92	22.8
Mean . . .	0 14 46.95	129 55 20.37
Div., Flex., etc.	. .	+ 0.53

LACAILLE 61.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 16 40.88	129 56 40.6
Nov. 17 F.	40.78	41.5
Dec. 11 F.	40.74	43.4
Mean . . .	0 16 40.80	129 56 41.83
Div., Flex., etc.	. .	+ 0.53

B. A. C. 79.

1877.	h. m. s.	° ′ ″
July 29 S.	. . .	38 39 45.0
Dec. 14 E.	. . .	43.7
Mean	. . .	38 39 44.35
Div., Flex., etc. .	. . . .	− 0.85

B. A. C. 79 (Ref.).

1877.	h. m. s.	° ′ ″
July 29 S.	. . .	38 39 42.8
Dec. 14 E.	. . .	43.4
Mean	. . .	38 39 43.10
Div., Flex.. etc. .	. . . .	+ 1.18

LACAILLE 81.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 19 17.24	129 56 22.1
Nov. 17 F.	17.11	23.8
Dec. 11 F.	17.03	23.9
Mean . . .	0 19 17.13	129 56 23.27
Div., Flex., etc.	. .	+ 0.53

LALANDE 512.

1877.	h. m. s.	° ′ ″
Sept. 26 (6) P.	0 19 5.89	88 44 28.9
Dec. 15 F.	5.82	29.4
Mean . . .	0 19 5.86	88 44 29.16
Div., Flex., etc.	. .	+ 0.16

12 CETI.

1877.	h. m. s.	° ′ ″
July 30 (6.2) P.	0 23 45.66	94 38 14.6
Oct. 14 P.	45.65	13.3
24 P.	45.76	14.7
Nov. 19 P.	45.75	14.1
Dec. 3 (5.8) P.	45.75	15.4
Mean . . .	0 23 45.71	94 38 14.42
Div., Flex., etc.	. .	+ 0.25

12 CETI (Ref.).

1877.	h. m. s.	° ′ ″
July 30 P.	. . .	94 38 13.5
Div., Flex., etc.	. . .	+ 0.51

B. A. C. 123.

1877.	h. m. s.	° ′ ″
Sept. 26 (7.5) P.	0 25 25.67	36 51 51.2
Dec. 15 F.	25.72	52.9
Mean . . .	0 25 25.70	36 51 52.05
Div., Flex.. etc.	. .	− 0.88

B. A. C. 126.

1877.	h. m. s.	° ′ ″
Oct. 15 E.	. . .	27 44 50.6
Div., Flex., etc. .	. . .	− 0.93

B. A. C. 126 (Ref.).

1877.	h. m. s.	° ′ ″
Oct. 15 E.	. . .	27 44 48.2
Div., Flex., etc. .	. . .	+ 1.53

B. A. C. 136^1.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 27 42.14	125 39 49.7
Dec. 15 F.	41.96	50.6
Mean . . .	0 27 42.05	125 39 50.15
Div., Flex., etc.	. .	+ 0.43

B. A. C. 136^2.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	0 27 42.22	125 39 55.6
Dec. 15 F.	42.09	56.5
Mean . . .	0 27 42.16	125 39 56.05
Div., Flex., etc.	. .	+ 0.43

B. A. C. 139.

1877.	h. m. s.	° ′ ″
Nov. 12 E.	0 28 21.99	28 48 48.9
Div., Flex., etc.	. .	− 0.93

B. A. C. 152.

1877.	h. m. s.	° ′ ″
Oct. 14 P.	0 30 5.55	46 10 24.7
Div., Flex., etc.	. .	− 0.74

B. A. C. 166.

1877.	h. m. s.	° ′ ″
Feb. 10 F.	0 32 45.09	59 48 43.1
13 E.	45.26	44.9
Oct. 15 E.	. .	44.0
Mean . . .	0 32 45.18	59 48 44.00
Div., Flex., etc.	. .	+ 0.09

B. A. C. 166 (Ref.).

1877.	h. m. s.	° ′ ″
Oct. 15 E.	. .	59 48 44.4
Div., Flex., etc.	. .	+ 0.26

WEISSE (2) 1062.

1877.	h. m. s.	° ′ ″
Oct. 14 (8.0) P.	0 42 29.97	49 35 18.8
23 E.	30.00	19.2
Nov. 7 F.	30.17	19.9
19 (8.0) P.	30.10	19.6
Mean . . .	0 42 30.06	49 35 19.38
Div., Flex., etc.	. .	− 0.33

B. A. C. 226.

1877.		h. m. s.	° ′ ″
Nov. 12	E.	0 42 44.05	42 54 22.1
13	F.	43.94	23.5
16	E.	43.85	23.9
Dec. 10	E.	44.03	21.7
Mean . . .		0 42 43.97	42 54 22.80
Div., Flex., etc.		. .	− 0.78

B. A. C. 227.

1877.		h. m. s.	° ′ ″
Oct. 14 (3.5)	P.	0 43 1.99	49 35 28.4
23	E.	2.08	29.4
Nov. 7	F.	2.22	29.8
19	P.	2.17	28.4
Mean . . .		0 43 2.12	49 35 29.00
Div., Flex., etc.		. .	− 0.33

B. A C. 253.

1877.		h. m. s.	° ′ ″
May 6	P.	0 49 . .	29 56 59.5
10	P.	17.90	61.1
Nov. 12	E.	17.63	60.9
Dec. 10	E.	17.85	58.8
Mean . . .		0 49 17.79	29 57 0.08
Div., Flex., etc.		. .	− 0.93

B. A. C. 253 (Ref.).

1877.		h. m. s.	° ′ ″
May 6	P.	. .	29 56 58.3
10	P.	. .	58.9
Nov. 12	E.	. .	57.8
Mean			29 56 58.33
Div., Flex., etc.			+ 1.51

B A. C. 259.

1877.		h. m. s.	° ′ ″
Feb. 10	F.	0 49 55.71	52 10 4.6
Dec. 8	F.	55.85	5.5
Mean . . .		0 49 55.78	52 10 5.05
Div., Flex., etc.		. .	− 0.05

ANONYMOUS.

1877.		h. m. s.	° ′ ″
Nov. 16 (10.5)	E.	0 51 32.06	88 21 17.4
Div., Flex., etc.		. .	+ 0.15

2 URSÆ MINORIS.

1877.		h. m. s.	° ′ ″
Feb. 8 (4)	P.	0 52 15.33	4 24 14.9
12	P.	14.98	. .
Oct. 18	P.	14.79	15.7
Dec. 3	P.	15.13	13.9
Mean . . .		0 52 15.06	4 24 14.83
Div., Flex., etc.		. .	− 0.95

2 URSÆ MINORIS, S. P.

1877.		h. m. s.	° ′ ″
Feb. 20	P.	0 52 15.40	355 35 46.0
May 15	P.	15.57	48.0
23 (4.5)	P.	16.01	47.8
29	P.	14.47	. .
Mean . . .		0 52 15.36	355 35 47.27
Div., Flex., etc.		. .	− 1.03

ANONYMOUS.

1877.		h. m. s.	° ′ ″
Nov. 2	S.	0 54 52.90	85 57 42.1
Div., Flex., etc.		. .	+ 0.11

B. A. C. 303.

1877.		h. m. s.	° ′ ″
Nov. 12	E.	0 58 30.32	85 0 12.2
Div., Flex., etc.		. .	+ 0.10

β ANDROMEDÆ.

1877.		h. m. s.	° ′ ″
Feb. 8	P.	1 2 . .	55 1 57.0
10	F.	50.87	56.3
12	P.	50.99	. .
13	E.	50.99	56.8
17	E.	50.96	56.1
21	E.	50.91	56.7
28	P.	50.95	57.8
Mar. 1	E.	50.87	56.7
May 3	E.	50.89	56.8
6	P.	50.88	55.3
July 30	P.	50.83	56.0
Sept. 26	P.	50.88	55.4
Oct. 31	E.	50.88	55.4
Nov. 19	P.	50.96	56.0
Dec. 3	P.	50.88	56.3
Mean . . .		1 2 50.91	55 1 56.33
Div., Flex., etc.		. .	+ 0.20

ANONYMOUS.

1877.		h. m. s.	° ′ ″
Oct. 18	P.	1 3 40.85	82 46 23.1
Div., Flex., etc.		. .	− 0.02

B. A. C. 345.

1877.		h. m. s.	° ′ ″
Oct. 24	P.	1 4 19.93	59 13 47.3
Nov. 12	E.	19.85	47.3
Dec. 14	E.	19.94	47.4
Mean . . .		1 4 19.91	59 13 47.33
Div., Flex., etc.		. .	+ 0.08

B. A. C. 450.

1877.		h. m. s.	° ′ ″
Nov. 12	E.	1 24 22.08	27 2 26.8
Div., Flex., etc.		. .	− 0.94

ANONYMOUS.

1877.		h. m. s.	° ′ ″
Nov. 13	F.	1 28 59.02	69 23 38.8
Div., Flex., etc.		. .	− 0.14

B. A. C. 495.

1877.		h. m. s.	° ′ ″
Dec. 10	E.	1 32 37.73	73 59 57.6
15	F.	37.61	59.3
Mean . . .		1 32 37.67	73 59 58.45
Div., Flex., etc.		. .	− 0.20

ANONYMOUS.

1877.		h. m. s.	° ′ ″
Nov. 7	F.	1 33 2.92	68 43 30.6
Div., Flex., etc.		. .	− 0.13

B. A. C. 501.

1877.		h. m. s.	° ′ ″
Nov. 3	F.	1 33 17.55	47 19 31.4
Div.. Flex., etc.		. .	− 0.58

B. A. C. 508^1.

1877.		h. m. s.	° ′ ″
Nov. 3	F.	1 34 8.89	31 59 42.6
Dec. 11	F.	8.85	42.3
15	F.	8.90	42.7
Mean . . .		1 34 8.88	31 59 42.53
Div., Flex., etc.		. .	− 0.94

WEISSE 767.

1877.		h. m. s.	° ′ ″
Dec. 10	E.	1 44 20.55	79 33 58.8
Div., Flex., etc.		. .	− 0.21

WEISSE 791^1.

1877.		h. m. s.	° ′ ″
Dec. 14	E.	1 45 30.60	79 47 52.8
Div., Flex., etc.		. .	− 0.20

WEISSE 791^2.

1877.		h. m. s.	° ′ ″
Dec. 14	E.	1 45 30.72	79 47 49.7
Div., Flex., etc.		. .	− 0.20

B. A. C. 569.

1877.		h. m. s.	° ′ ″
Oct. 31	E.	. . . . .	61 1 15.5
Div., Flex., etc.		. .	+ 0.12

B. A. C. 569 (Ref.).

1877.		h. m. s.	° ′ ″
Oct. 31	E.	. . . . .	61 1 18.5
Div., Flex., etc.		. .	+ 0.27

B. A. C. 587.

1877.		h. m. s.	° ′ ″
Nov. 2	S.	1 50 17.72	43 30 22.8
Dec. 14	E.	17.53	20.5
Mean . . .		1 50 17.62	43 30 21.65
Div., Flex., etc.		. .	− 0.77

B. A. C. 609.

1877.		h. m. s.	° ′ ″
Oct. 31	E.	1 52 50.88	78 18 10.5
Dec. 15	F.	50.98	10.8
Mean . . .		1 52 50.93	78 18 10.65
Div., Flex., etc.		. .	− 0.22

B. A. C. 646.

1877.		h. m. s.	° ′ ″
Oct. 23	E.	2 0 5.98	32 9 47.4
Dec. 14	E.	6.11	46.9
Mean . . .		2 0 6.04	32 9 47.15
Div., Flex., etc.		. .	+ 0.94

Piazzi II, 10.

1877.		h. m. s.	° ′ ″
Oct. 23	E.	2 4 45.90	131 26 53.0
Dec. 14	E.	45.88	51.0
Mean . . .		2 4 45.89	131 26 52.00
Div., Flex., etc.		. .	+ 0.55

Lalande 3987.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	2 5 40.69	22 53 38.8
Div., Flex., etc.	. .	− 1.01

Lalande 4219².

1877.	h. m. s.	° ′ ″
Nov. 19 8.(5) P.	2 9 58.85	108 48 24.4
Div., Flex., etc.	. .	+ 0.11

Bradley 329.

1877.	h. m. s.	° ′ ″
Oct. 18 (5) P.	2 13 8.07	93 32 13.5
24 P.	8.03	12.3
Dec. 3 (2) P.	8.01	13.0
Mean . . .	2 13 8.04	93 32 12.93
Div., Flex., etc.	. .	+ 0.27

Piazzi II, 57.

1877.	h. m. s.	° ′ ″
Oct. 18 (9.8) P.	2 13 15.82	93 31 57.5
24 P.	15.65	56.9
Dec. 3 (10) P.	15.76	57.6
Mean . . .	2 13 15.74	93 31 57.33
Div., Flex., etc.	. .	+ 0.27

Anonymous.

1877.	h. m. s.	° ′ ″
Nov. 3 F.	2 21 34.43	59 5 37.2
Div., Flex., etc.	. .	+ 0.07

ξ^2 Ceti.

1877.	h. m. s.	° ′ ″
Oct. 18 (4.5) P.	2 21 37.29	82 5 32.8
24 P.	37.24	32.0
Nov. 16 E.	37.27	33.0
19 P.	37.27	32.8
20 E.	37.31	32.5
Dec. 3 P.	37.22	33.1
Mean . . .	2 21 37.27	82 5 32.70
Div., Flex., etc.	. .	− 0.08

Anonymous.

1877.	h. m. s.	° ′ ″
Nov. 2 S.	2 21 46.62	59 3 25.0
Div., Flex., etc.	. .	+ 0.07

B. A. C. 777.

1877.	h. m. s.	° ′ ″
Nov. 16 E.	2 26 22.54	17 43 18.9
20 E.	22.77	18.9
Dec. 18 E.	22.51	18.3
Mean . . .	2 26 22.61	17 43 18.70
Div., Flex., etc.	. .	− 1.19

Lalande 4803.

1877.	h. m. s.	° ′ ″
Oct. 18 (6.2) P.	2 29 20.39	83 42 3.6
23 E.	20.39	4.2
24 P.	20.37	3.0
Nov. 12 E.	20.40	2.6
16 E.	20.35	3.3
Dec. 18 E.	20.35	4.3
Mean . . .	2 29 20.38	83 42 3.50
Div., Flex., etc.	. .	+ 0.06

Anonymous.

1877.	h. m. s.	° ′ ″
Nov. 7 P.	2 29 38.63	72 53 34.0
Div., Flex., etc.	. .	− 0.21

Lalande 4885.

1877.	h. m. s.	° ′ ″
Nov. 19 (7.5) P.	2 31 13.76	59 42 13.1
Div., Flex., etc.	. .	+ 0.09

B. A. C. 863.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	2 41 . .	34 37 0.9
Nov. 2 S.	. .	0.4
16 E.	44.12	0.4
Mean . . .	2 41 44.12	34 37 0.57
Div., Flex., etc.	. .	− 0.96

B. A. C. 863 (Ref.)

1877.	h. m. s.	° ′ ″
Oct. 23 E.	. . . . .	34 37 0.0
Nov. 2 S.	. .	36 59.2
Mean	. .	34 36 59.60
Div., Flex., etc.	. .	+ 1.36

O. Arg. N. 3176.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	2 42 34.10	10 14 57.2
Dec. 14 E.	33.85	58.3
Mean . . .	2 42 33.98	10 14 57.75
Div., Flex., etc.	. .	− 1.14

B. A. C. 872.

1877.	h. m. s.	° ′ ″
Dec. 18 E.	2 42 44.78	63 14 52.4
Div., Flex., etc.	. .	+ 0.06

B. A. C. 893.

1877.	h. m. s.	° ′ ″
Oct. 18 P.	2 46 2.46	130 26 25.2
Nov. 19 P.	2.41	26.0
20 E.	2.51	24.2
Dec. 3 P.	2.50	26.3
Mean . . .	2 46 2.47	130 26 25.42
Div., Flex., etc.	. .	+ 0.54

Anonymous.

1877.	h. m. s.	° ′ ″
Dec. 3 (11.5) P.	2 50 45.45	68 56 42.0
14 E.	45.83	42.0
Mean . . .	2 50 45.64	68 56 42.00
Div., Flex., etc.	. .	− 0.14

ε Arietis.

1877.	h. m. s.	° ′ ″
Nov. 19 P.	2 52 10.84	69 9 10.6
Div., Flex., etc.	. .	− 0.14

O. Arg. N. 3326.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	2 52 33.84	10 11 5.5
Dec. 14 E.	33.93	1.3
Mean . . .	2 52 33.88	10 11 3.40
Div., Flex., etc.	. .	− 1.14

B. A. C. 908.

1877.	h. m. s.	° ′ ″
Dec. 3 (6.0) P.	2 52 46.20	9 0 32.3
Div., Flex., etc.	. .	− 1.18

B. A. C. 908, S. P.

1877.	h. m. s.	° ′ ″
May 23 (6.2) P.	2 52 46.04	350 59 29.0
Div., Flex., etc.	. .	− 1.27

B. A. C. 962.

1877.	h. m. s.	° ′ ″
April 7 F.	3 0 11.97	40 51 31.6
Oct. 18 P.	. .	30.9
Dec. 11 F.	. .	31.4
Mean	. .	40 51 31.30
Div., Flex., etc.	. .	− 0.81

B. A. C. 962 (Ref.).

1877.	h. m. s.	° ′ ″
Oct 18 P.	. . . . .	40 51 29.5
Dec. 11 F.	. .	27.9
Mean	. .	40 51 28.70
Div., Flex., etc.	. .	+ 1.08

Taylor 1144.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 15 1.08	133 32 32.1
Nov. 20 E.	1.28	30.3
Dec. 14 E.	1.34	24.7
Mean . . .	3 15 1.23	133 32 29.03
Div., Flex., etc.	. .	+ 0.59

B. A. C. 1074.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 21 10.58	126 21 12.8
Nov. 19 P.	10.61	11.3
20 E.	10.72	8.4
Mean . . .	3 21 10.64	126 21 10.83
Div., Flex., etc.	. .	+ 0.45

Lacaille 1103.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 21 13.90	126 23 24.7
Nov. 19 P.	13.96	24.9
20 E.	13.97	23.9
Mean . . .	3 21 13.94	126 23 24.50
Div., Flex., etc.	. .	+ 0.46

B. A. C. 1085.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 23 26.84	126 16 50.5
Nov. 19 P.	26.87	49.0
20 E.	27.00	48.1
Mean . . .	3 23 26.90	126 16 49.20
Div., Flex., etc.	. .	+ 0.45

Lalande (F.) 519.

1877.	h. m. s.	° ′ ″
Jan. 24 E.	3 26 24.28	3 44 40.8
Oct. 24 P.	25.04	41.7
Dec. 11 F.	23.45	43.0
Mean . . .	3 26 24.26	3 44 41.83
Div., Flex., etc.	. .	+ 0.93

Lalande (F.) 519, S. P.

1877.	h. m. s.	° ′ ″
Mar. 15 (6.2) P.	3 26 23.74	356 15 18.9
Div., Flex., etc.	. .	− 1.02

ε Eridani.

1877.	h. m. s.	° ′ ″
Dec. 3 P.	3 27 8.12	99 52 33.2
Div., Flex., etc.	. .	+ 0.09

B. A. C. 1125.

1877.	h. m. s.	° ′ ″
Nov. 20 E.	3 32 40.89	130 40 46.0
Dec. 14 E.	41.10	43.0
Mean . . .	3 32 41.00	130 40 44.50
Div., Flex., etc.	. .	+ 0.54

B. A. C. 1136^1.

1877.	h. m. s.	° ′ ″
Nov. 20 E.	3 35 21.28	130 44 59.8
Dec. 14 E.	21.53	56.8
Mean . . .	3 35 21.40	130 44 58.30
Div., Flex., etc.	. .	+ 0.54

B. A. C. 1136^2.

1877.	h. m. s.	° ′ ″
Nov. 20 E.	3 35 21.84	130 45 4.0
Dec. 14 E.	21.86	5.0
Mean . . .	3 35 21.85	130 45 4.50
Div., Flex., etc.	. .	+ 0.54

B. A. C. 1145.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 36 48.13	131 9 51.2
Div., Flex., etc.	. .	+ 0.55

B. A. C. 1167.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 39 45.14	131 2 47.4
Div., Flex., etc.	. .	+ 0.55

B. A. C. 1227.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	3 50 4.62	130 43 15.0
Div., Flex., etc.	. .	+ 0.54

B. A. C. 1247.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	3 59 53.11	6 29 54.7
Dec. 3 (5.2) P.	52.25	55.4
Mean . . .	3 59 52.68	6 29 55.05
Div., Flex., etc.	. .	− 1.07

B. A. C. 1247, S. P.

1877.	h. m. s.	° ′ ″
May 15 P.	3 59 52.31	353 30 6.8
Div., Flex., etc.	. .	− 1.08

B. A. C. 1287.

1877.	h. m. s.	° ′ ″
Dec. 14 E.	4 5 52.34	41 54 19.0
Div., Flex., etc.	. .	− 0.80

51 Tauri.

1877.	h. m. s.	° ′ ″
Jan. 29 F.	4 11 6.55	68 43 24.5
Div., Flex., etc.	. .	− 0.13

53 Tauri.

1877.	h. m. s.	° ′ ″
Jan. 29 F.	4 12 11.21	69 9 26.8
Div., Flex., etc.	. .	− 0.14

62^1 Tauri.

1877.	h. m. s.	° ′ ″
Jan. 29 F.	4 16 32.88	65 59 4.6
Feb. 20 P.	32.90	5.9
Mean . . .	4 16 32.89	65 59 5.25
Div., Flex., etc.	. .	0.00

62^2 Tauri.

1877.	h. m. s.	° ′ ″
Jan. 26 S.	4 16 34.91	65 59 15.2
29 F.	34.88	15.6
Feb. 20 P.	34.89	16.4
Mean . . .	4 16 34.89	65 59 15.73
Div., Flex., etc.	. .	0.00

Weisse 326.

1877.	h. m. s.	° ′ ″
Dec. 3 (8.5) P.	4 17 16.66	87 14 54.7
8 (8.5) F.	16.73	53.8
11 F.	16.77	57.3
Mean . . .	4 17 16.72	87 14 55.27
Div., Flex., etc.	. .	+ 0.14

Weisse 340.

1877.	h. m. s.	° ′ ″
Dec. 14 E.	4 18 2.10	87 47 35.1
19 F.	1.94	36.2
Mean . . .	4 18 2.02	87 47 35.65
Div., Flex., etc.	. .	+ 0.15

Weisse 381.

1877.	h. m. s.	° ′ ″
Dec. 3 (7.8) P.	4 19 35.91	89 14 59.9
11 F.	35.94	15 0.7
Mean . . .	4 19 35.92	89 15 0.30
Div., Flex., etc.	. .	+ 0.16

B. A. C. 1373.

1877.	h. m. s.	° ′ ″
Jan. 25 F.	4 20 42.82	68 39 24.7
Div., Flex., etc.	. .	− 0.13

Lalande 8437.

1877.	h. m. s.	° ′ ″
Dec. 14 E.	4 22 25.91	87 54 2.1
19 F.	25.97	3.6
Mean . . .	4 22 25.94	87 54 2.85
Div., Flex., etc.	. .	+ 0.15

Weisse 544.

1877.	h. m. s.	° ′ ″
Dec. 3 (8.2) P.	4 27 11.37	89 14 19.1
11 F.	11.46	20.7
Mean . . .	4 27 11.42	89 14 19.90
Div., Flex., etc.	. .	+ 0.16

Weisse 548.

1877.	h. m. s.	° ′ ″
Dec. 8 (9) F.	4 27 19.54	86 48 43.9
Div., Flex., etc.	. .	+ 0.13

Weisse 632.

1877.	h. m. s.	° ′ ″
Dec. 14 E.	4 30 38.70	87 40 16.7
Div., Flex., etc.	. .	+ 0.15

Weisse 685.

1877.	h. m. s.	° ′ ″
Dec. 3 (8.8) P.	4 32 46.05	88 6 55.6
Div., Flex., etc.	. .	+ 0.15

Anonymous.

1877.	h. m. s.	° ′ ″
Jan. 29 F.	4 34 6.96	68 2 30.9
Div., Flex., etc.	. .	− 0.11

Weisse 727.

1877.	h. m. s.	° ′ ″
Dec. 14 E.	4 34 33.39	87 43 48.4
Div., Flex., etc.	. .	+ 0.15

Lalande 8824^2.

1877.	h. m. s.	° ′ ″
Dec. 8 F.	4 34 36.09	89 16 39.7
19 F.	35.95	38.3
Mean . . .	4 34 36.02	89 16 39.00
Div., Flex., etc.	. .	+ 0.16

Schjellerup 1499.

1877.	h. m. s.	° ′ ″
Dec. 11 (9) F.	4 35 9.44	88 20 20.1
Div., Flex., etc.	. .	+ 0.15

Weisse 777.

1877.	h. m. s.	° ′ ″
Dec. 19 F.	4 36 39.72	89 7 36.5
Div., Flex., etc.	. .	+ 0.16

Anonymous.

1877.	h. m. s.	° ′ ″
Dec. 8 F.	4 37 1.81	88 9 24.0
Div., Flex., etc.	. .	+ 0.15

B. A. C. 1448.

1877.	h. m. s.	° ′ ″
Feb. 10 F.	4 37 24.40	9 0 60.3
20 P.	24.07	59.6
Oct. 24 P.	24.60	58.7
Mean . . .	4 37 24.36	9 0 59.53
Div., Flex., etc.	. .	− 1.18

B. A. C. 1448, S. P.

1877.	h. m. s.	° ′ ″
Mar. 15 (5.8) P.	4 37 24.32	350 59 3.7
Div., Flex., etc.	. .	− 1.27

Weisse 817.

1877.	h. m. s.	° ′ ″
Dec. 14 E.	4 38 55.10	87 35 27.4
Div., Flex., etc.	. .	+ 0.15

Weisse 902.

1877.	h. m. s.	° ′ ″
Dec. 3 (8.0) P.	4 43 9.48	88 0 52.3
11 F.	9.62	52.1
Mean . . .	4 43 9.55	88 0 52.2
Div., Flex , etc.	. .	+ 0.15

Weisse 936.

1877.		h. m. s.	° ′ ″
Dec.	19 F.	4 44 24.41	89 3 52.7
Div., Flex., etc.		. .	+ 0.16

Schjellerup 1564.

1877.		h. m. s.	° ′ ″
Dec.	11 F.	4 45 52.32	88 21 30.0
Div., Flex., etc.		. .	+ 0.15

B. A. C. 1514.

1877.		h. m. s.	° ′ ″
Feb.	7 S.	. . . . .	87 45 46.2
Div., Flex., etc.		. .	+ 0.15

B. A. C. 1514 (Ref.).

1877.		h. m. s.	° ′ ″
Feb.	7 S.	. . . . .	87 45 43.6
Div., Flex., etc.		. .	+ 0.50

Weisse 1067.

1877.		h. m. s.	° ′ ″
Dec.	11 F.	4 49 47.80	87 1 16.0
Div., Flex., etc.		. .	+ 0.14

Lalande 9270.

1877.		h. m. s.	° ′ ″
Dec.	19 F.	4 49 47.54	88 9 14.3
Div., Flex., etc.		. .	+ 0.15

B. A. C. 1536.

1877.		h. m. s.	° ′ ″
Jan.	30 S.	. . . . .	29 44 27.4
Div., Flex., etc.		. .	− 0.93

B. A. C. 1536 (Ref.).

1877.		h. m. s.	° ′ ″
Jan.	30 S.	. . . . .	29 44 22.6
Div., Flex., etc.		. .	+ 1.52

Lalande 9400.

1877.		h. m. s.	° ′ ″
Dec.	11 F.	4 53 41.53	86 53 57.3
	19 F.	41.45	57.1
Mean . . .		4 53 41.49	86 53 57.20
Div., Flex., etc.		. .	+ 0.14

Weisse 1223.

1877.		h. m. s.	° ′ ″
Dec.	19 F.	4 56 2.79	88 7 56.6
Div., Flex., etc.		. .	+ 0.15

Lalande 9484.

1877.		h. m. s.	° ′ ″
Feb.	20 P.	4 56 56.68	62 28 40.9
Div., Flex., etc.		. .	+ 0.09

Lalande 9561.

1877.		h. m. s.	° ′ ″
Dec.	11 F.	4 58 36.06	87 31 35.2
Div., Flex., etc.		. .	+ 0.15

Durch. 27°, 744.

1877.		h. m. s.	° ′ ″
Feb.	14 F.	5 9 9.95	62 25 20.2
Dec.	3 (9.0) P.	9.99	18.2
Mean . . .		5 9 9.97	62 25 19.20
Div., Flex., etc.		. .	+ 0.09

B. A. C. 1619.

1877.		h. m. s.	° ′ ″
Feb.	21 E.	5 10 23.28	12 7 30.3
Div., Flex., etc.		. .	− 1.10

B. A. C. 1650.

1877.		h. m. s.	° ′ ″
Jan.	30 (7.0) S.	5 13 2.87	125 1 0.8
Feb.	7 S.	2.94	2.0
	8 P.	2.98	1.5
	14 F.	3.12	2.1
Mean . . .		5 13 2.98	125 1 1.60
Div., Flex., etc.		. .	+ 0.40

B. A. C. 1662.

1877.		h. m. s.	° ′ ″
Feb.	20 P.	5 22 45.29	4 52 19.6
Dec.	3 (6.2) P.	45.77	18.0
Mean . . .		5 22 45.53	4 52 18.80
Div., Flex., etc.		. .	− 0.97

B. A. C. 1662, S. P.

1877.		h. m. s.	° ′ ″
May	15 P.	5 22 45.96	355 7 43.5
July	6 (6.5) P.	45.85	43.5
Mean . . .		5 22 45.90	355 7 43.50
Div., Flex., etc.		. .	− 1.03

Lacaille 1855.

1877.		h. m. s.	° ′ ″
Feb.	21 E.	5 23 16.23	122 31 12.4
Div., Flex., etc.		. .	+ 0.39

Weisse 633.

1877.		h. m. s.	° ′ ″
Feb.	6 F.	5 26 52.57	96 35 7.2
	10 F.	52.47	4.6
	14 F.	52.53	5.3
Mean . . .		5 26 52.52	96 35 5.70
Div., Flex., etc.		. .	+ 0.14

Weisse 632.

1877.		h. m. s.	° ′ ″
Feb.	6 F.	5 26 52.86	96 35 41.9
	10 F.	52.79	42.0
	14 F.	52.80	44.7
Mean . . .		5 26 52.82	96 35 42.87
Div., Flex., etc.		. .	+ 0.14

θ^1 Orionis.

1877.		h. m. s.	° ′ ″
Feb.	15 S.	5 29 14.11	95 28 21.9
Div., Flex., etc.		. .	+ 0.21

θ^2 Orionis.

1877.		h. m. s.	° ′ ″
Feb.	15 S.	5 29 20.70	95 29 56.7
Div., Flex., etc.		. .	+ 0.21

ι Orionis.

1877.		h. m. s.	° ′ ″
Feb.	9 E.	5 29 25.01	95 59 34.1
Div., Flex., etc.		. .	+ 0.18

B. A. C. 1767.

1877.		h. m. s.	° ′ ″
Feb.	20 P.	. . . . .	68 56 5.1
Div., Flex., etc.		. .	− 0.14

B. A. C. 1767 (Ref.).

1877.		h. m. s.	° ′ ″
Feb.	20 P.	. . . . .	68 56 4.2
Div., Flex., etc.		. .	+ 0.38

B. A. C. 1781.

1877.		h. m. s.	° ′ ″
Jan.	30 (8.2) S.	5 32 13.08	125 8 34.4
Div., Flex., etc.		. .	+ 0.41

B. A. C. 1794^1.

1877.		h. m. s.	° ′ ″
Feb.	10 F.	5 34 33.15	92 0 35.8
Dec.	3 (2.5) P.	33.15	32.3
Mean . . .		5 34 33.15	92 0 34.05
Div., Flex., etc.		. .	+ 0.21

B. A. C. 1794^2.

1877.		h. m. s.	° ′ ″
Feb.	10 F.	5 34 33.29	92 0 38.5
Dec.	3 (5) P.	33.35	35.5
Mean . . .		5 34 33.32	92 0 37.00
Div., Flex., etc.		. .	+ 0.21

Weisse (2) 1090.

1877.		h. m. s.	° ′ ″
Feb.	17 E.	5 35 36.64	51 48 39.5
	21 E.	36.63	38.1
Mean . . .		5 35 36.64	51 48 38.80
Div., Flex., etc.		. .	− 0.11

Weisse (2) 1103.

1877.		h. m. s.	° ′ ″
Feb.	17 E.	5 35 47.99	51 47 34.9
	21 E.	48.04	31.8
Mean . . .		5 35 48.02	51 47 33.35
Div., Flex., etc.		. .	− 0.11

Durch. 38°, 1283.

1877.		h. m. s.	° ′ ″
Feb.	17 E.	5 37 50.26	51 54 43.1
	21 E.	50.24	42.2
Mean . . .		5 37 50.25	51 54 42.65
Div., Flex., etc.		. .	− 0.09

Weisse (2) 1235.

1877.		h. m. s.	° ′ ″
Feb.	17 E.	5 39 7.61	51 52 41.8
	21 E.	7.61	39.7
Mean . . .		5 39 7.61	51 52 40.75
Div., Flex., etc.		. .	− 0.10

B. A. C. 1825.

1877.		h. m. s.	° ′ ″
Jan.	26 S.	5 39 26.40	129 27 43.6
	30 S.	26.48	46
Feb.	9 E.	26.47	4
Mean . . .		5 39 26.45	129 27
Div., Flex., etc.		. .	+

B. A. C. 1842.

1877.		h. m. s.	° ′ ″
Jan. 26	S.	5 41 20.66	129 21 48.7
30	S.	20.66	48.3
Feb. 9	E.	20.54	48.2
Mean . . .		5 41 20.62	129 21 48.40
Div., Flex., etc.		. .	+ 0.52

B. A. C. 1843.

1877.		h. m. s.	° ′ ″
Feb. 10	F.	5 41 55.41	99 42 56.0
14	F.	55.51	55.5
Mean . . .		5 41 55.46	99 42 55.75
Div., Flex., etc.		. .	+ 0.08

B. A. C. 1849.

1877.		h. m. s.	° ′ ″
Feb. 15	S.	5 43 . . .	30 8 36.6
20	P.	56.74	35.5
Mean . . .		5 43 56.74	30 8 36.05
Div., Flex., etc.		. .	− 0.93

B. A. C. 1849 (Ref.).

1877.		h. m. s.	° ′ ″
Feb. 15	S.	. . . .	30 8 33.3
20	P.	. .	31.3
Mean . . .		. . . .	30 8 32.30
Div., Flex., etc.		. .	+ 1.50

B. A. C. 1889.

1877.		h. m. s.	° ′ ″
Jan. 26	S.	5 48 21.75	127 39 31.0
30 (7.8)	S.	21.55	31.4
Feb. 6	F.	21.71	30.0
Mean . . .		5 48 21.67	127 39 30.80
Div., Flex., etc.		. .	+ 0.49

B. A. C. 1891.

1877.		h. m. s.	° ′ ″
Feb. 7 (6.8)	S.	5 48 39.05	123 49 49.0
10	F.	39.03	47.5
14	F.	39.04	48.0
Mean . . .		5 48 39.04	123 49 48.17
Div., Flex., etc.		. .	+ 0.38

B. A. C. 1892.

1877.		h. m. s.	° ′ ″
Feb. 15	S.	5 48 40.72	128 33 14.4
Div., Flex., etc.		. .	+ 0.51

YARNALL 2456.

1877.		h. m. s.	° ′ ″
Feb. 17	E.	5 50 53.25	119 56 21.8
21	E.	53.26	22.1
Mean . . .		5 50 53.26	119 56 21.95
Div., Flex., etc.		. .	+ 0.41

YARNALL 2455.

1877.		h. m. s.	° ′ ″
Feb. 17	E.	5 50 55.15	119 59 16.0
21	E.	55.01	16.2
Mean . . .		5 50 55.08	119 59 16.10
Div., Flex., etc.		. .	+ 0.41

TAYLOR 2245.

1877.		h. m. s.	° ′ ″
Feb. 6	F.	5 52 13.86	121 59 35.5
14	F.	13.75	36.0
Mean . . .		5 52 13.80	121 59 35.75
Div., Flex., etc.		. .	+ 0.40

B. A. C. 1939.

1877.		h. m. s.	° ′ ″
Jan. 28	E.	. . . .	69 51 39.8
30	S.	. .	39.0
Mean . . .		. . . .	69 51 39.40
Div., Flex., etc.		. .	− 0.15

B. A. C. 1939 (Ref.).

1877.		h. m. s.	° ′ ″
Jan. 28	E.	. . . .	69 51 38.2
30	S.	. .	38.3
Mean . . .		. . . .	69 51 38.25
Div., Flex., etc.		. .	+ 0.36

B. A. C. 1879.

1877.		h. m. s.	° ′ ″
Dec. 3 (6.5)	P.	5 57 48.11	3 14 16.5
Div., Flex., etc.		. .	− 0.94

B. A. C. 1879, S. P.

1877.		h. m. s.	° ′ ″
July 6 (7)	P.	5 57 48.63	356 45 45.3
Div., Flex., etc.		. .	− 1.01

WEISSE (2) 1913.

1877.		h. m. s.	° ′ ″
Feb. 17	E.	5 59 45.44	52 0 21.1
21	E.	45.27	20.1
Mean . . .		5 59 45.36	52 0 20.60
Div., Flex., etc.		. .	− 0.08

ν ORIONIS.

1877.		h. m. s.	° ′ ″
Feb. 8	P.	6 0 32.89	75 13 9.3
Div., Flex., etc.		. .	− 0.17

DURCH. 31°, 1217.

1877.		h. m. s.	° ′ ″
Feb. 17	E.	6 2 27.35	58 33 30.1
Div., Flex., etc.		. .	+ 0.08

DURCH. 31°, 1221.

1877.		h. m. s.	° ′ ″
Feb. 17	E.	6 2 44.06	58 39 8.0
Div., Flex., etc.		. .	+ 0.08

PIAZZI VI, 6.

1877.		h. m. s.	° ′ ″
Jan. 26	S.	6 2 53.01	132 17 6.2
Feb. 6	F.	53.14	6.2
7 (8.8)	S.	53.14	7.4
14	F.	53.03	8.0
Mean . . .		6 2 53.08	132 17 6.95
Div., Flex., etc.		. .	+ 0.57

PIAZZI VI, 12.

1877.		h. m. s.	° ′ ″
Jan. 30 (8)	S.	6 4 3.81	132 8 10.2
Feb. 6	F.	3.89	9.8
14	F.	. .	11.9
Mean . . .		6 4 3.85	132 8 10.63
Div., Flex., etc.		. .	+ 0.56

PIAZZI VI, 34.

1877.		h. m. s.	° ′ ″
Feb. 6	F.	6 7 7.75	135 15 22.9
10	F.	7.85	24.3
15	S.	7.80	22.4
Mean . . .		6 7 7.80	135 15 23.20
Div., Flex., etc.		. .	+ 0.60

B. A. C. 2036.

1877.		h. m. s.	° ′ ″
Feb. 10	F.	6 12 50.15	127 41 46.8
Div., Flex., etc.		. .	+ 0.49

LALANDE 12148¹.

1877.		h. m. s.	° ′ ″
Feb. 21	E.	6 15 39.63	72 22 6.5
Div., Flex., etc.		. .	− 0.20

B. A. C. 2054.

1877.		h. m. s.	° ′ ″
Feb. 10	F.	6 15 44.85	129 26 1.8
14	F.	44.96	2.2
Mean . . .		6 15 44.90	129 26 2.00
Div., Flex., etc.		. .	+ 0.52

B. A. C. 2072.

1877.		h. m. s.	° ′ ″
Feb. 7 (8.7)	S.	6 18 36.07	120 52 59.5
Div., Flex., etc.		. .	+ 0.48

O. ARG. N. 6808.

1877.		h. m. s.	° ′ ″
Jan. 24	E.	6 19 6.90	. . . .
Feb. 9	E.	5.94	10 18 47.7
Mean . . .		6 19 6.42	. .
Div., Flex., etc.		. .	− 1.14

B. A. C. 2079.

1877.		h. m. s.	° ′ ″
Feb. 13	E.	6 19 45.04	123 38 42.5
Div., Flex., etc.		. .	+ 0.38

BRISBANE 1230.

1877.		h. m. s.	° ′ ″
Feb. 13	E.	6 19 49.24	126 38 17.0
Div., Flex., etc.		. .	+ 0.47

B. A. C. 2098.

1877.		h. m. s.	° ′ ″
Jan. 28	E.	6 21 50.53	130 54 16.7
30	S.	50.38	13.
Feb. 6	F.	50.39	14.
10	F.	50.42	14.
Mean . . .		6 21 50.43	130 54 14
Div., Flex., etc.		. .	+ 0

O. Arg. S. 5133.

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	6	22	14.16	115	46	47.6
	21	E.			14.01			48.3
Mean . . .			6	22	14.08	115	46	47.95
Div., Flex., etc.					. .			+ 0.37

O. Arg. S. 5144.

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	6	22	43.73	115	46	13.4
Div., Flex., etc.					. .			+ 0.37

O. Arg. S. 5176.

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	6	24	10.03	115	48	21.7
	21	E.			9.88			22.6
Mean . . .			6	24	9.96	115	48	22.15
Div., Flex., etc.					. .			+ 0.37

B. A. C. 2117.

1877.			h.	m.	s.	°	′	″
Jan.	28	E.	6	24	46.41	130	59	46.8
	30	S.			46.14			42.8
Feb.	6	F.			46.40			44.6
	10	F.			46.26			49.5
Mean . . .			6	24	46.30	130	59	45.92
Div., Flex., etc.					. .			+ 0.55

B. A. C. 2122.

1877.			h.	m.	s.	°	′	″
Feb.	7	S.	6	25	7.23	130	17	31.4
	14	F.			7.35			32.5
Mean			6	25	7.29	130	17	31.95
Div., Flex., etc.					. .			+ 0.54

O. Arg. S. 5198.

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	6	25	7.65	115	48	7.1
	21	E.			7.56			6.4
Mean . . .			6	25	7.60			6.75
Div., Flex., etc.					. .			+ 0.37

O. Arg. S. 5199.

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	6	25	8.61	115	48	25.6
	21	E.			8.57			27.0
Mean . . .			6	25	8.59	115	48	26.30
Div., Flex., etc.					. .			+ 0.37

Brisbane 1256.

1877.			h.	m.	s.	°	′	″
Feb.	7	S.	6	25	12.73	.	.	.
	14	F.			13.10	130	17	59.9
Mean . . .			6	25	12.92			. .
Div., Flex., etc.					. .			+ 0.54

23 (H.) Camelopardalis.

1877.			h.	m.	s.	°	′	″
Jan.	24	E.	6	25	13.01	10	18	. .
Feb.	9	E.			12.62			31.5
Dec.	3 (5.5)	P.			12.08			30.8
Mean . . .			6	25	12.57	10	18	31.15
Div., Flex., etc.					. .			− 1.14

23 (H.) Camelopardalis (Ref.).

1877.			h.	m.	s.	°	′	″
Dec.	3	P.	.	.	. . .	10	18	28.9
Div., Flex., etc.			.	.	. . .			+ 1.34

B. A. C. 2135.

1877.			h.	m.	s.	°	′	″
Feb.	7	S.	6	26	41.67	130	21	47.2
	14	F.			41.67			44.9
Mean . . .			6	26	41.67	130	21	46.05
Div., Flex., etc.					. .			+ 0.54

B. A. C. 2147.

1877.			h.	m.	s.	°	′	″
Feb.	20	P.	6	28	2.98	121	56	25.6
Div., Flex., etc.					. .			+ 0.40

B. A. C. 2153.

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	6	29	2.31	128	31	52.4
Feb.	15	S.			2.37			56.2
Mean . . .			6	29	2.34	128	31	54.30
Div., Flex., etc.					. .			+ 0.51

B. A. C. 2179.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	6	32	51.41	128	2	37.7
	28	E.			51.60			40.5
	30	S.			51.36			36.0
Mean . . .			6	32	51.46	128	2	38.07
Div., Flex., etc.					. .			+ 0.49

B. A. C. 2195.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	6	35	45.48	128	2	42.9
	28	E.			45.71			44.9
	30	S.			45.59			41.5
Mean . . .			6	35	45.59	128	2	43.10
Div., Flex., etc.					. .			+ 0.49

B. A. C. 2194.

1877.			h.	m.	s.	°	′	″
Dec.	3	P.	.	.	. . .	64	44	55.9
Div., Flex., etc.					. .			+ 0.02

B. A. C. 2194 (Ref.).

1877.			h.	m.	s.	°	′	″
Dec.	3	P.	.	.	. . .	64	44	56.9
Div., Flex., etc.					. .			+ 0.32

B. A. C. 2207^1.

1877.			h.	m.	s.	°	′	″
Feb.	7 (9)	S.	6	38	5.94	128	16	47.4
	14	F.			6.08			47.2
Mean . . .			6	38	6.01	128	16	47.30
Div., Flex., etc.					. .			+ 0.50

B. A. C. 2207^2.

1877.			h.	m.	s.	°	′	″
Feb.	7 (8.2)	S.	6	38	6.59	128	16	48.3
	14	F.			6.73			47.0
Mean . . .			6	38	6.66	128	16	47.65
Div., Flex., etc.					. .			+ 0.50

B, A. C. 2225.

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	6	41	59.08	127	38	40.5
Feb.	6	F.			59.12			41.4
	15	S.			59.13			42.0
Mean . . .			6	41	59.11	127	38	41.30
Div., Flex., etc.					. .			+ 0.49

B. A. C, 2231.

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	6	43	9.04	127	47	41.9
Feb.	6	F.			8.92			41.3
	15	S.			9.00			42.9
Mean . . .			6	43	8.99	127	47	42.03
Div., Flex., etc.					. .			+ 0.49

B. A. C. 2246.

1877.			h.	m.	s.	°	′	″
Feb.	7	S.	6	45	14.85	122	22	6.5
Div., Flex., etc.					. .			+ 0.39

B. A. C. 2258.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	6	47	22.30	126	4	54.0
Feb.	14	F.			22.37			53.9
Mean . . .			6	47	22.34	126	4	53.95
Div., Flex., etc.					. .			+ 0.44

Yarnall 2790.

1877.			h.	m.	s.	°	′	″
Feb.	20	P.	6	48	34.94	114	14	4.2
Div., Flex., etc.					. .			+ 0.33

B. A. C. 2288.

1877.			h.	m.	s.	°	′	″
Feb.	10	F.	6	52	53.54	125	20	41.7
Div., Flex., etc.					. .			+ 0.41

Anonymous.

1877.			h.	m.	s.	°	′	″
Feb.	10	F.	6	53	11.11	125	18	4.3
Div., Flex., etc.					. .			+ 0.41

B. A. C. 2295.

1877.			h.	m.	s.	°	′	″
Feb.	14	F.	6	53	55.07	123	56	47.2
	15	S.			55.13			45.8
Mean . . .			6	53	55.10	123	56	46.50
Div., Flex., etc.					. .			+ 0.38

Weisse (2) 1656.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	6	50	10.34	62	59	9.0
	28	E.			10.18			9.6
Mean . . .			6	56	10.26	62	59	9.30
Div., Flex., etc.					. .			+ 0.07

B. A. C. 2305.

1877.			h.	m.	s.	°	′	″
Feb.	13	E.	.	.	. . .			
Div., Flex., etc.					. .			

B. A. C. 2305 (Ref.).

1877.			h.	m.	s.	°	′	″
Feb.	13	E.			. . . . .	69	15	3.4
Div., Flex., etc.					. .		+	0.38

Lalande 13681.

1877.			h.	m.	s.	°	′	″
Feb.	6	F.	6	58	27.65	61	37	26.5
	7	S.			27.70			29.9
	9	E.			27.66			30.2
	14	F.			27.50			28.2
Mean . . .			6	58	27.63	61	37	28.70
Div., Flex., etc.					. .		+	0.11

Lalande 13700.

1877.			h.	m.	s.	°	′	″
Feb.	6	F.	6	59	1.71	61	35	58.2
	9	E.			1.73			59.8
	14	F.			1.68		36	1.1
Mean . . .			6	59	1.71	61	35	59.70
Div., Flex., etc.					. .		+	0.11

Lalande 13724.

1877.			h.	m.	s.	°	′	″
Feb.	6	F.	6	59	41.99	61	38	. .
	7	S.			41.97			10.2
	9	E.			41.93			9.5
	14	F.			41.82			9.8
Mean . . .			6	59	41.93	61	38	9.83
Div., Flex., etc.					. .		+	0.11

Lalande 13757.

1877.			h.	m.	s.	°	′	″
Feb.	6	F.	7	0	36.61	61	36	4.5
	7	S.			36.48			6.8
	9	E.			36.48			8.1
	14	F.			36.48			6.7
Mean . . .			7	0	36.51	61	36	6.52
Div., Flex., etc.					. .		+	0.11

Piazzi VI, 344.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	7	2	3.54	132	8	23.5
Div., Flex., etc.					. .		+	0.56

Durch. 28°, 1331.

1877.			h.	m.	s.	°	′	″
Feb.	6	F.	7	3	59.06	61	36	32.8
	9	E.			58.98			36.4
	14	F.			58.80			35.3
Mean . . .			7	3	58.95	61	36	34.83
Div., Flex., etc.					. .		+	0.11

Lalande 13905.

1877.			h.	m.	s.	°	′	″
Feb.	6	F.	7	4	42.46	61	35	10.3
	7	S.			42.42			14.4
	9	E.			42.36			13.0
	14	F.			42.27			11.9
Mean . . .			7	4	42.38	61	35	12.40
Div., Flex., etc.					. .		+	0.11

B. A. C. 2326.

1877.			h.	m.	s.	°	′	″
Feb.	8	P.	7	5	5.10	7	21	30.4
July	29	P.			3.98			31.3
Mean . . .			7	5	4.54	7	21	30.85
Div., Flex., etc.					. .		−	1.13

B. A. C. 2326, S. P.

1877.			h.	m.	s.	°	′	″
Feb.	7	P.	7	5	5.10	352	38	32.2
June	14	F.			5.78			32.9
Mean . . .			7	5	5.44	352	38	32.55
Div., Flex., etc.					. .		−	1.15

B. A. C. 2372.

1877.			h.	m.	s.	°	′	″
Feb.	13	E.	7	7	12.26	128	53	59.6
	15	S.			12.17			59.0
Mean . . .			7	7	12.22	128	53	59.30
Div., Flex., etc.					. .		+	0.52

Taylor 2910.

1877.			h.	m.	s.	°	′	″
Jan.	27 (7)	P.	7	7	19.79	120	37	2.0
	28	E.			19.83			1.5
Mean . . .			7	7	19.81	120	37	1.75
Div., Flex., etc.					. .		+	0.42

B. A. C. 2386.

1877.			h.	m.	s.	°	′	″
Feb.	25	E.	7	9	10.62	120	7	48.1
Div., Flex., etc.					. .		+	0.41

δ^1 Geminorum.

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	7	12	46.44	67	47	41.6
Div., Flex., etc.					. .		−	0.10

B. A. C. 2427.

1877.			h.	m.	s.	°	′	″
Feb.	15	S.	7	14	22.03	128	59	11.3
Div., Flex., etc.					. .		+	0.52

B. A. C. 2446.

1877.			h.	m.	s.	°	′	″
Feb.	13	E.	7	17	54.17	121	48	40.9
Div., Flex., etc.					. .		+	0.40

B. A. C. 2439.

1877.			h.	m.	s.	°	′	″
Feb.	8	P.	7	18	3.63	21	17	11.9
	9	E.			3.76			13.4
Mean . . .			7	18	3.70	21	17	12.65
Div., Flex., etc.					. .		−	1.08

B. A. C. 2439, S. P.

1877.			h.	m.	s.	°	′	″
July	30	P.	7	18	3.81	338	42	48.8
Div., Flex., etc.					. .		−	1.12

B. A. C. 2439 (Ref.).

1877.			h.	m.	s.	°	′
Feb.	8	P.			. . . . .	21	17
	9	E.			. .		
Mean						21	17
Div., Flex., etc.					. .		+

B. A. C. 2449.

1877.			h.	m.	s.	°	′
Feb.	13	E.	7	18	18.58	121	41
Div., Flex., etc.					. .		+

B. A. C. 2471.

1877.			h.	m.	s.	°	′
Feb.	10	F.	7	22	8.22	123	53
	15	S.			8.25		
Mean . . .			7	22	8.24	123	53
Div., Flex., etc.					. .		+

B. A. C. 2477[1].

1877.			h.	m.	s.	°	′
Feb.	6	F.	7	24	7.90	121	35
	7	S.			7.72		
	15	S.			7.86		
Mean . . .			7	24	7.83	121	35
Div., Flex., etc.					. .		+

B. A. C. 2477[2].

1877.			h.	m.	s.	°	′
Feb.	6	F.	7	24	8.48	121	35
	7	S.			8.29		
	15	S.			8.38		
Mean . . .			7	24	8.38	121	35
Div., Flex., etc.					. .		+

Piazzi VII, 137.

1877.			h.	m.	s.	°	′
Jan.	26	S	7	25	55.74	120	42
	27 (5)	P.			55.63		
Feb.	8 (5)	P.			55.57		
Mean . . .			7	25	55.65	120	42
Div., Flex., etc.					. .		+

α^1 Geminorum.

1877.			h.	m.	s.	°	′
Jan.	28	E.	7	26	44.59	57	50
Feb.	6	F.			44.46		
Mar.	23	S.			44.54		
Aug.	9	S.			44.58		
Mean . . .			7	26	44.54	57	50
Div., Flex., etc.					. .		+

B. A. C. 2502.

1877.			h.	m.	s.	°	′
Feb.	8 (6.5)	P.	7	29	24.08	126	4
	10	F.			24.03		
	13	E.			24.12		
	25	E.			23.91		
Mean . . .			7	29	24.04	126	4
Div., Flex., etc.					. .		+

B. A. C. 2523.

1877.			h.	m.	s.	°	′
Jan.	30	S.	7	32	49.06	124	41
Feb.	3	S.			49.16		
Mean . . .			7	32	49.11	124	41
Div., Flex., etc.					. .		+

ANONYMOUS.

1877	h.	m.	s.	°	′	″
Feb. 13 E.	7	32	55.98	126	8	28.7
15 S.			56.00			29.3
25 E.			55.72			29.5
Mean . . .	7	32	55.90	126	8	29.17
Div., Flex., etc.			. .		+	0.45

B. A. C. 2536.

1877.	h.	m.	s.	°	′	″
Feb. 8 (6.2) P.	7	34	16.46	126	13	3.2
10 F.			16.54			1.6
13 E.			16.64			2.1
Mean . . .	7	34	16.55	126	13	2.30
Div., Flex., etc.			. .		+	0.45

B. A. C. 2543.

1877.	h.	m.	s.	°	′	″
Jan. 26 S.	7	35	7.27	128	1	36.8
30 S.			7.24			36.6
Feb 3 S.			7.42			34.9
Mean . . .	7	35	7.31	128	1	36.10
Div., Flex., etc.			. .		+	0.49

B. A. C. 2545.

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	7	35	23.07	127	51	25.5
Div., Flex., etc.			. .		+	0.49

B. A. C. 2546.

1877.	h.	m.	s.	°	′	″
Jan. 26 S.	7	35	27.50	127	58	40.1
30 S.			27.48			42.3
Feb. 3 S.			27.70			40.8
Mean . . .	7	35	27.56	127	58	41.07
Div., Flex., etc.			. .		+	0.49

B. A. C. 2561.

1877.	h.	m.	s.	°	′	″
Feb. 10 F.	7	38	41.97	125	45	32.5
15 S.			42.03			30.1
25 E.			41.84			33.2
Mean . . .	7	38	41.95	125	45	31.93
Div., Flex., etc.			. .		+	0.43

B. A. C. 2572.

1877.	h.	m.	s.	°	′	″
Feb. 10 F.	7	39	40.01	125	46	16.4
15 S.			40.19			16.3
25 E.			39.96			16.9
Mean . . .	7	39	40.05	125	46	16.53
Div., Flex., etc.			. .		+	0.43

B. A. C. 2575.

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	7	40	11.45	127	38	53.1
Div., Flex., etc.			. .		+	0.49

LACAILLE 2956.

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	7	40	41.48	127	35	27.0
Div., Flex., etc.			. .		+	0.49

B. A. C. 2580.

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	7	40	52.40	127	40	17.2
Div., Flex., etc.			. .		+	0.49

B. A. C. 2604.

1877.	h.	m.	s.	°	′	″
Jan. 26 S.	7	43	56.20	130	20	46.8
30 S.			56.18			47.7
Mean . . .	7	43	56.19	130	20	47.25
Div., Flex., etc.			. .		+	0.54

B. A. C. 2614.

1877.	h.	m.	s.	°	′	″
Jan. 26 S.	7	45	2.04	130	23	32.2
30 S.			2.00			33.9
Mean . . .	7	45	2.02	130	23	33.05
Div., Flex., etc.			. .		+	0.54

B. A. C. 2609.

1877.	h.	m.	s.	°	′	″
Jan. 28 E.	7	45	. .	42	7	8.1
Feb. 3 S.			. .			8.6
8 P.			44.91			8.2
9 E.			45.08			8.1
13 E.			. .			9.1
19 S.			. .			8.3
Mean . . .	7	45	45.00	42	7	8.40
Div., Flex., etc.			. .		—	0.80

B. A. C. 2609 (Ref.).

1877.	h.	m.	s.	°	′	″
Jan. 28 E.	. .	. .	. .	42	7	6.6
Feb, 3 S.			. .			6.4
8 P.			. .			7.0
9 E.			. .			9.8
13 E.			. .			7.0
19 S.			. .			6.8
Mean . . .	. .	. .	. .	42	7	7.27
Div., Flex., etc.			. .		+	1.09

B. A. C. 2634.

1877.	h.	m.	s.	°	′	″
Jan. 26 S.	7	47	59.44	130	15	34.5
30 S.			59.29			37.7
Mean . . .	7	47	59.36	130	15	36.07
Div., Flex., etc.			. .		+	0.54

B. A. C. 2659.

1877.	h.	m.	s.	°	′	″
Jan. 27 (6) P.	7	53	44.29	72	21	21.4
30 S.			44.27			21.3
Feb. 3 S.			44.30			20.4
Mean . . .	7	53	44.29	72	21	21.03
Div., Flex., etc.			. .		—	0.20

B. A. C. 2685.

1877.	h.	m.	s.	°	′	″
Feb. 15 S.	7	57	7.58	126	56	35.2
Div., Flex., etc.			. .		+	0.48

B. A. C. 2697.

1877.	h.	m.	s.	°	′	″
Feb. 13 E.	. .	. .	. .	38	8	29.7
25 E.			. .			28.9
Mean . . .	. .	. .	. .	38	8	29.30
Div., Flex., etc.			. .		—	0.87

B. A. C. 2697 (Ref.).

1877.	h.	m.	s.	°	′	″
Feb. 13 E.	. .	. .	. .	38	8	29.3
25 E.			. .			26.4
Mean . . .	. .	. .	. .	38	8	27.85
Div., Flex., etc.			. .		+	1.20

B. A. C. 2717.

1877.	h.	m.	s.	°	′	″
Feb, 10 F.	8	0	19.02	123	14	34.4
15 S.			19.12			33.7
Mean . . .	8	0	19.07	123	14	34.05
Div., Flex., etc.			. .		+	0.38

B. A. C. 2677.

1877.	h.	m.	s.	°	′	″
Feb. 8 (6.2) P.	8	0	33.40	7	11	39.0
Div., Flex., etc.			. .		—	1.12

B. A. C. 2677, S. P.

1877.	h.	m.	s.	°	′	″
May 31 (6.5) P.	8	0	33.58	352	48	23.8
Div., Flex., etc.			. .		—	1.14

B. A. C. 2719¹.

1877.	h.	m.	s.	°	′	″
Feb. 10 F.	8	1	0.01	123	13	7.9
15 S.			0.21			9.3
Mean . . .	8	1	0.11	123	13	8.60
Div., Flex., etc.			. .		+	0.38

B. A. C. 2719².

1877.	h.	m.	s.	°	′	″
Feb. 10 F.	8	1	1.97	123	13	7.1
15 S.			1.92			7.1
Mean . . .	8	1	1.94	123	13	7.10
Div , Flex., etc.			. .		+	0.38

B. A. C. 2743.

1877.	h.	m.	s.	°	′	″
Feb. 17 E.	8	4	31.08	125	5	44.8
Div., Flex., etc.			. .		+	0.40

B. A. C. 2758.

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	8	6	29.14	126	55	40.6
17 E.			28.98			40.1
Mar. 9 E.			28.83			41.0
Mean . . .	8	6	28.98	126	55	40.57
Div., Flex., etc.			. .		+	0.48

B. A. C. 2762.

1877.	h.	m.	s.	°	′	″
Mar. 15 (5.5) P.	8	6	57.82	129	15	11.6
Div., Flex., etc.			. .		+	0.52

B. A. C. 2775.

1877.	h.	m.	s.	°	′	″
Feb. 8 P.	8	7	19.27	121	46	8.1
Div., Flex., etc.			. .		+	0.40

B. A. C. 2780.

1877.	h.	m.	s.	°	′	″
Mar. 9 (5) E.	8	9	40.67	129	58	24.4
Div., Flex., etc.			. .		+	0.53

B. A. C. 2778.

1877.	h. m. s.	° ′ ″
Feb. 10 F.	. . . . .	80 26 13.8
25 E.	. .	14.9
Mean . . .	. . . . .	80 26 14.35
Div., Flex., etc.	. .	− 0.19

B. A. C. 2778 (Ref.).

1877.	h. m. s.	° ′ ″
Feb. 10 F.	. . .	80 26 12.4
25 E.	. .	13.2
Mean . . .	. .	80 26 12.80
Div., Flex., etc.	. .	+ 0.44

B. A. C. 2794.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	8 13 35.83	125 4 6.4
17 E.	-- 35.65	9.0
19 S.	35.71	9.0
Mean . . .	8 13 35.73	125 4 8.13
Div., Flex., etc.	. .	+ 0.40

B. A. C. 2795.

1877.	h. m. s.	° ′ ″
Jan. 30 S.	8 13 57.04	126 16 45.2
Mar. 9 E.	57.07	45.4
20 F.	57.16	45.7
Mean . . .	8 13 57.09	126 16 45.43
Div., Flex., etc.	. .	+ 0.45

B. A. C. 2809.

1877.	h. m. s.	° ′ ″
Feb. 3 (8.2) S.	8 16 57.13	129 13 46.4
8 P.	57.22	50.2
17 E.	57.03	46.3
Mean . . .	8 16 57.13	129 13 47.63
Div., Flex., etc.	. .	+ 0.52

B. A. C. 2820.

1877.	h. m. s.	° ′ ″
Jan. 28 E.	8 18 44.21	127 53 28.9
30 S.	44.14	26.2
Feb. 3 (7.8) S.	44.34	22.9
Mean . . .	8 18 44.23	127 53 26.00
Div., Flex., etc.	. .	+ 0.49

B. A. C. 2819.

1877.	h. m. s.	° ′ ″
Jan. 27 P.	8 20 . .	28 52 23.9
Feb. 10 F.	. .	25.8
21 E.	. .	23.9
Mar. 15 (3.5) P.	1.83	23.9
July 29 P.	1.99	23.3
Mean . . .	8 20 1.91	28 52 24.16
Div., Flex., etc.	. .	− 0.93

B. A. C. 2819 (Ref.).

1877.	h. m. s.	° ′ ″
Jan. 27 P.	. . . . .	28 52 21.0
Feb. 10 F.	. .	20.9
21 E.	. .	20.3
Mar. 15 P.	. .	20.6
Mean	. . . . .	28 52 20.70
Div., Flex., etc.	. .	− 0.93

ANONYMOUS.

1877.	h. m. s.	° ′ ″
Feb. 17 E.	8 21 31.06	82 45 42.0
Div., Flex., etc.	. .	− 0.02

LACAILLE 3325.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	8 22 19.92	121 16 5.0
Mar. 9 E.	19.79	5.8
20 F.	19.74	5.8
Mean . . .	8 22 19.88	121 16 5.53
Div., Flex., etc.	. .	+ 0.41

ANONYMOUS.

1877.	h. m. s.	° ′ ″
Feb. 15 S.	8 22 54.20	83 0 13.8
Div., Flex., etc.	. .	0.00

η CANCRI.

1877.	h. m. s.	° ′ ″
Feb. 8 (6) P.	8 25 35.65	69 8 34.0
19 S.	. .	33.9
Mar. 15 (6.2) P.	35.50	33.8
Mean . . .	8 25 35.58	69 8 33.90
Div., Flex., etc.	. .	− 0.14

η CANCRI (Ref.).

1877.	h. m. s.	° ′ ″
Feb. 19 S.	. . . . .	69 8 32.8
Div., Flex., etc.	. .	+ 0.38

LACAILLE 3373.

1877.	h. m. s.	° ′ ″
Jan. 28 E.	8 26 33.53	128 38 51.0
Mar. 9 E.	33.38	50.7
Mean . . .	8 26 33.46	128 38 50.85
Div., Flex., etc.	. .	+ 0.51

B. A. C. 2877.

1877.	h. m. s.	° ′ ″
Jan. 28 E.	8 26 52.23	128 38 59.4
Mar. 9 E.	52.00	59.5
Mean . . .	8 26 52.12	128 38 59.45
Div., Flex., etc.	. .	+ 0.51

BRISBANE 2071.

1877.	h. m. s.	° ′ ″
Mar. 9 E.	8 27 24.18	128 39 1.4
Div., Flex., etc.	. .	+ 0.51

B. A. C. 2890.

1877.	h. m. s.	° ′ ″
Jan. 30 S.	8 29 4.43	128 25 43.8
Div., Flex., etc.	. .	+ 0.50

B. A. C. 2900.

1877.	h. m. s.	° ′ ″
Feb. 13 E.	8 30 41.37	129 32 56.4
21 E.	41.08	58.6
Mean . . .	8 30 41.22	129 32 57.50
Div., Flex., etc.	. .	+ 0.53

ANONYMOUS.

1877.	h. m. s.	° ′ ″
Feb. 6 F.	8 30 52.23	84 7 45.9
Div., Flex., etc.	. .	+ 0.08

B. A. C. 2901.

1877.	h. m. s.	° ′ ″
Jan. 27 P.	. . . . .	83 52 7.8
Div., Flex., etc.	. .	+ 0.07

B. A. C. 2901 (Ref.).

1877.	h. m. s.	° ′ ″
Jan. 27 P.	. . . . .	83 52 7.3
Div., Flex., etc.	. .	+ 0.57

B. A. C. 2933.

1877.	h. m. s.	° ′ ″
Jan. 26 S.	8 34 39.80	126 10 32.4
28 E.	39.80	32.4
30 (8) S.	39.76	28.7
Feb. 8 P.	39.70	29.9
Mean . . .	8 34 39.76	126 10 30.85
Div., Flex., etc.	. .	+ 0.45

B. A. C. 2941.

1877.	h. m. s.	° ′ ″
Feb. 10 F.	8 35 48.46	129 49 42.9
13 E.	48.35	41.1
15 S.	48.38	40.5
Mean . . .	8 35 48.40	129 49 41.50
Div., Flex., etc.	. .	+ 0.53

B. A. C. 2974.

1877.	h. m. s.	° ′ ″
Jan. 27 (7) P.	8 40 7.88	126 42 6.4
30 S.	7.83	4.5
Feb. 8 P.	7.78	5.1
Mean . . .	8 40 7.83	126 42 5.33
Div., Flex., etc.	. .	+ 0.47

B. A. C. 2980.

1877.	h. m. s.	° ′ ″
Feb. 13 E.	8 41 56.31	124 10 25.6
15 S.	56.29	21.4
25 E.	56.17	24.8
Mean . . .	8 41 56.26	124 10 23.93
Div., Flex., etc.	. .	+ 0.38

LACAILLE 3525.

1877.	h. m. s.	° ′ ″
Feb. 13 E.	8 42 30.77	124 9 1.5
15 S.	30.82	8 58.2
25 E.	30.60	58.9
Mean . . .	8 42 30.73	124 8 59.53
Div., Flex., etc.	. .	+ 0.38

B. A. C. 3009.

1877.	h. m. s.	° ′ ″
April 7 F.	8 45 4.59	129 51 47.3
Div., Flex., etc.	. .	+ 0.53

B. A. C. 3012.

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	8	45	13.84	128	41	8.2
Feb.	3 (8.5)	S.			13.92			7.6
Mar.	9	E.			13.81			7.4
Mean . . .			8	45	13.86	128	41	7.73
Div., Flex., etc.					. .		+	0.51

B. A. C. 3024.

1877.			h.	m.	s.	°	′	″
April	11	F.	8	47	22.39	130	31	29.6
Div., Flex., etc.					. .		+	0.54

B. A. C. 3030.

1877.			h.	m.	s.	°	′	″
Feb.	8	P.	8	48	6.31	128	15	40.9
Mar.	9	E.			6.19			40.1
	23	S.			6.45			41.4
Mean . . .			8	48	6.32	128	15	40.80
Div., Flex., etc.					. .		+	0.50

O. Arg. N. 9450.

1877.			h.	m.	s.	°	′	″
Feb.	9 (8.5)	E.	8	49	56.14	41	20	43.0
Mar.	15 (9.2)	P.			56.00			41.3
Mean . . .			8	49	56.07	41	20	42.15
Div., Flex., etc.					. .		—	0.81

B. A. C. 3081.

1877.			h.	m.	s.	°	′	″
Jan.	30 (6.5)	S.	8	55	29.99	130	46	33.3
Feb.	14	F.			30.03			33.7
	15	S.			30.10			33.2
Mean . . .			8	55	30.04	130	46	33.40
Div., Flex., etc.					. .		+	0.55

B. A. C. 3079.

1877.			h.	m.	s	°	′	″
Feb.	3	S.	8	55	32.62	65	3	52.7
	7	S.			32.68			54.1
	9	E.			32.61			52.4
Mean . . .			8	55	32.64	65	3	53.07
Div., Flex., etc.					. .		+	0.02

Abo 185.

1877.			h.	m.	s.	°	′	″
April	7	F.	8	56	38.84	38	41	16.7
	11	F.			39.03			19.2
Mean . . .			8	56	38.94	38	41	17.95
Div., Flex., etc.					. .		—	0.85

B. A. C. 3094.

1877.			h.	m.	s.	°	′	″
Feb.	19	S.	8	57	23.72	128	55	9.5
Mar.	9	E.			23.59			12.1
	23	S.			23.80			12.7
Mean . . .			8	57	23.70	128	55	11.43
Div., Flex., etc.					. .		+	0.52

Lalande 18067.

1877.			h.	m.	s.	°	′	″
Mar.	30	F.	9	2	41.90	104	38	32.3
April	11	F.			42.05			33.5
Mean . . .			9	2	41.98	104	38	32.90
Div., Flex., etc.					. .		+	0.14

Lalande (F.) 1457.

1877.			h.	m.	s.	°	′	″
April	7	F.	9	5	58.93	36	47	19.1
	11	F.			59.25			20.6
Mean . . .			9	5	59.09	36	47	19.85
Div., Flex., etc.					. .		—	0.89

Lalande (F.) 1458.

1877.			h.	m.	s.	°	′	″
April	7	F.	9	6	0.79	36	47	9.1
	11	F.			1.17			9.8
Mean . . .			9	6	0.98	36	47	9.45
Div., Flex., etc.					. .		—	0.89

B. A. C. 3146.

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	9	7	. .	87	10	4.1
Feb.	3	S.			. .			5.0
	7	S.			. .			5.4
Mar.	15 (4.5)	P.			57.91			5.9
Mean . . .			9	7	. . .	87	10	5.10
Div., Flex., etc.					. .		+	0.14

B. A. C. 3146 (Ref.).

1877.			h.	m.	s.	°	′	″
Jan.	30	S.	9	7	. .	87	10	4.5
Feb.	3	S.			. .			4.6
	7	S.			. .			2.7
Mar.	15	P.			. .			4.5
Mean . . .			9	7	. .	87	10	4.08
Div., Flex., etc.					. .		+	0.51

B. A. C. 3158.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	9	10	3.02	127	5	30.5
Feb.	14	F.			2.98			33.9
	19	S.			2.89			31.3
Mean . . .			9	10	2.96	127	5	31.90
Div., Flex., etc.					. .		+	0.48

B. A. C. 3163.

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	9	10	45.83	128	3	29.8
Mar.	9	E.			45.86			30.4
Mean . . .			9	10	45.84	128	3	30.10
Div., Flex., etc.					. .		+	0.49

B. A. C. 3192[1].

1877.			h.	m.	s.	°	′	″
Feb.	3	S.	9	15	32.04	121	14	18.9
	10	F.			31.92			22.5
	13	E.			31.80			24.0
	14	F.			32.07			22.4
Mean . . .			9	15	31.96	121	14	21.95
Div., Flex., etc.					. .		+	0.42

B. A. C. 3192[2].

1877.			h.	m.	s.	°	′	″
Feb.	13	E.	9	15	32.15	121	14	23.7
	14	F.			32.24			21.7
Mean . . .			9	15	32.20	121	14	22.70
Div., Flex., etc.					. .		+	0.42

B. A. C. 3193.

1877.			h.	m.	s.	°	′	″
Feb.	15	S.	9	15	33.31	127	3	37.3
	17	E.			33.25			34.9
	19	S.			33.30			36.6
	21	E.			33.36			41.1
Mean . . .			9	15	33.30	127	3	37.48
Div , Flex., etc.					. .		+	0.48

Bradley 1321.

1877.			h.	m.	s.	°	′	″
Mar.	30	F.	9	17	49.83	69	41	13.6
Div.. Flex., etc.					. .		—	0.15

B. A. C. 3230.

1877.			h.	m.	s.	°	′	″
Feb.	7	S.	9	21	37.84	129	58	10.6
	13	E.			37.84			12.9
	14	F.			37.99			10.8
Mean . . .			9	21	37.89	129	58	11.43
Div., Flex., etc.					. .		+	0.53

B. A. C. 3254[1].

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	9	25	29.68	121	21	1.6
	25	E.			29.78			2.3
Mar.	9	E.			29.79			1.1
April	11	F.			29.87			4.5
Mean . . .			9	25	29.78	121	21	2.38
Div., Flex., etc.					. .		+	0.41

B. A. C. 3254[2].

1877.			h.	m.	s.	°	′	″
Feb.	17	E.	9	25	30.14	121	20	55.8
	25	E.			30.16			53.6
Mar.	9	E.			30.18			54.3
April	11	F.			30.31			57.1
Mean . . .			9	25	30.20	121	20	55.20
Div., Flex., etc.					. .		+	0.41

B. A. C. 3257.

1877.			h.	m.	s.	°	′	″
Feb.	7	S.	9	25	51.35	129	55	44.2
	13	E.			51.61			45.6
	14	F.			51.45			47.3
Mean . . .			9	25	51.47	129	55	45.70
Div., Flex., etc.					. .		+	0.53

B. A. C. 3262.

1877.			h.	m.	s.	°	′	″
Jan.	30 (7)	S.	9	26	16.63	121	19	48.7
Feb.	17	E.			16.47			49.2
	25	E.			16.76			51.4
Mar.	9	E.			16.60			50.1
April	11	F.			16.66			52.6
Mean . . .			9	26	16.62	121	19	50.4
Div., Flex., etc.					. .		+	0.41

B. A. C. 3267.

1877.			h.	m.	s.	°	′	″
Jan.	26	S.	9	27	26.36	130	6	23.2
Div., Flex., etc.					. .		+	0.53

Piazzi IX, 142.

1877.			h.	m.	s.	°	'	"
Jan.	30 (6.8)	S.	9	31	52.38	121	37	34.7
Feb.	3	S.			52.34			34.7
Mar.	9	E.			52.29			34.6
Mean . . .			9	31	52.34	121	32	34.67
Div., Flex., etc.					. .		+	0.41

B. A. C. 3303.

1877.			h.	m.	s.	°	'	"
Mar.	15	P.			. . . . .	90	35	8.4
Div., Flex., etc.					. .		+	0.16

B. A. C. 3303 (Ref.).

1877.			h.	m.	s.	°	'	"
Mar.	15	P.			. . . . .	90	35	7.1
Div., Flex., etc.					. .		+	0.48

Weisse 774.

1877.			h.	m.	s.	°	'	"
Jan.	27 (9.2)	P.	9	36	38.00	91	40	50 9
Feb.	25	E.			37.87			50.2
	28 (9)	P.			37.93			50.1
April	25	P.			37.90			51.4
Mean . . .			9	36	37.92	91	40	50.65
Div., Flex., etc.					. .		+	0.20

Anonymous.

1877.			h.	m.	s.	°	'	'
Jan.	27 (10.5)	P.	9	36	45.65	91	42	48.0
Feb.	25	E.			45.67			44.3
	28 (10.8)	P.			45.59			46.6
Mean . . .			9	36	45.64	92	42	46.30
Div., Flex., etc.					. .		+	0.20

B. A. C. 3346.

1877.			h.	m.	s.	°	'	"
July	30	P.	9	42	13.75	30	23	3.0
Div., Flex., etc.					. .		−	0.93

Anonymous.

1877.			h.	m.	s.	°	'	"
April	12	S.	9	45	22.21	79	39	35.5
Div., Flex., etc.					. .		−	0.21

Lalande 19442.

1877.			h.	m.	s.	°	'	"
Feb.	3	S.	9	49	56.28	74	41	19.5
	7 (8.0)	S.			56.22			21.1
Mean . . .			9	49	56.25	74	41	20.30
Div., Flex., etc.					. .		−	0.19

Weisse (2) 1047.

1877.			h.	m.	s.	°	'	"
Jan.	30 (9)	S.	9	50	15.67	72	21	35.5
Feb.	21	E.			15.47			32.8
Mean . . .			9	50	15.57	72	21	34.15
Div., Flex., etc.					. .		−	0.20

Durch. 17°, 2160.

1877.			h.	m.	s.	°	'	"
Feb.	13	E.	9	51	52.73	72	43	21.3
April	11	F.			52.86			23.9
Mean . . .			9	51	52.80	72	43	22.60
Div., Flex., etc.					. .		−	0.20

Weisse (2) 1106. (?)*

1877.			h.	m.	s.	°	'	"
Feb.	15	S.	9	53	30.04	71	57	6.0
	21	E.			29.99			6.4
April	7	F.			29.96			8.4
	25	P.			30.08			8.1
Mean . . .			9	53	30.02	71	57	7.22
Div., Flex., etc.					. .		−	0.19

* Weisse's place agrees in R. A. with this star, and in Dec. with a star following about 25 seconds.

Weisse (2) 1158.

1877.			h.	m.	s.	°	'	"
Jan.	30 (9.2)	S.	9	55	35.97	72	58	21.5
Feb.	13	E.			35.97			22.1
	17	E.			35.89			22.7
Mean . . .			9	55	35.94	72	58	22.10
Div., Flex., etc.					. .		−	0.21

Weisse (2) 1236.

1877.			h.	m.	s.	°	'	"
Mar.	15 (7)	P.	9	59	0.38	73	38	44.2
April	11	F.			0.36			45.7
Mean . . .			9	59	0.37	73	38	44.95
Div., Flex., etc.					. .		−	0.20

B. A. C. 3452.

1877.			h.	m.	s.	°	'	"
Mar.	30	F.	10	0	15.04	120	17	38.1
Div., Flex., etc.					. .		+	0.41

Weisse (2) 74.

1877.			h.	m.	s.	°	'	"
Feb.	13	E.	10	5	24.40	74	31	3.2
Mar.	29	E.			24.43			2.5
Mean . . .			10	5	24.42	74	31	2.85
Div., Flex., etc.					. .		−	0.19

B. A. C. 3494.

1877.			h.	m.	s.	°	'	"
Feb.	15	S.	10	7	59.04	122	25	32.0
Div., Flex., etc.					. .		+	0.39

Weisse (2) 234.

1877.			h.	m.	s.	°	'	"
Jan.	27 (9.5)	P.	10	12	56.34	69	30	46.6
Feb.	3	S.			56.37			45.5
	6	F.			56.28			. .
	10	F.			56.18			46.0
	13	E.			56.26			46.1
	17	E.			56.30			45.8
	19	S.			56.26			. .
	21	E.			56.18			46.2
	27	S.			56.22			46.5
Mar.	29	E.			56.28			47.7
Mean . . .			10	12	56.27	69	30	46.30
Div., Flex., etc.					. .		−	0.15

γ^2 Leonis.

1877.			h.	m.	s.	°	'	"
Feb.	6	F.	10	13	11.87	69	32	16.7
	10	F.			11.78			13.9
	13	E.			11.67			14.5
	14	F.			11.63			18.4
	17	E.			11.54			15.8
	21	E.			11.63			. .

γ^2 Leonis—Continued.

1877.			h.	m.	s.	°	'	"
Mar.	9	E.	10	13	11.83	69	32	16.8
	23	S.			11.58			. .
April	11	F.			11.67			18.6
	12	S.			11.66			16.5
	22	E.			11.59			18.0
	23	F.			. .			18.7
Mean . . .			10	13	11.68	69	32	16.79
Div., Flex., etc.					. .		−	0.15

30 (H.) Camelopardalis.

1877.			h.	m.	s.	°	'	"
April	5 (5)	P.	10	15	54.84	6	49	3.1
July	30	P.			54.61			2.6
Nov.	27	P.			55.40			2.8
Mean . . .			10	15	54.95	6	49	2.83
Div., Flex., etc.					. .		−	1.10

B. A. C. 3553.

1877.			h.	m.	s.	°	'	"
Jan	27 (7)	P.	10	17	18.87	93	1	19.3
April	25 (6.5)	P.			18.86			19.8
Mean . . .			10	17	18.86	93	1	19.55
Div., Flex., etc.					. .		+	0.26

Weisse 331.

1877.			h.	m.	s.	°	'	"
Feb.	21	E.	10	20	40.80	78	3	28.6
Div., Flex., etc.					. .		−	0.22

45 Leonis.

1877.			h.	m.	s.	°	'	"
April	22	E.	10	21	9.26	79	36	42.6
Div., Flex., etc.					. .		−	0.21

Weisse 361.

1877.			h.	m.	s.	°	'	"
Feb.	7	S.	10	21	57.01	77	57	31.2
Div., Flex., etc.					. .		−	0.22

Anonymous.

1877.			h.	m.	s.	°	'	"
Mar.	15 (11.5)	P.	10	28	50.88	76	13	16.6
	23	S.			51.31			14.8
Mean . . .			10	28	51.10	76	13	15.70
Div., Flex., etc.					. .		−	0.16

B. A. C. 3652.

1877.			h.	m.	s.	°	'	"
Jan.	30	S.	10	34	. .	20	16	53.7
April	25 (5.5)	P.			14.23			54.4
Mean . . .			10	34	. .	20	16	54.05
Div., Flex., etc.					. .		−	1.13

B. A. C. 3652 (Ref.).

1877.			h.	m.	s.	°	'	"
Jan.	30	S.			. . . . .	20	16	49.8
April	25	P.			. . . . .			50.4
Mean . . .					. .	20	16	50.10
Div., Flex., etc.					. .		+	1.51

B. A. C. 3742^1.

1877.	h. m. s.	° ′ ″
Feb. 15 S.	10 48 . .	64 35 38.8
28 P.	. .	41.3
Mar. 15 (4.5) P.	57.05	41.9
April 22 E.	. .	41.3
Mean . . .	10 48 . .	64 35 40.82
Div., Flex., etc.	. .	+ 0.03

B. A. C. 3742^1 (Ref.).

1877.	h. m. s.	° ′ ″
Feb. 15 S.	. . . . .	64 35 41.8
28 P.	. . . . .	41.1
April 22 E.	. . . . .	40.3
Mean . . .	. .	64 35 41.07
Div., Flex., etc.	. .	+ 0.32

B. A. C. 3742^2.

1877.	h. m. s.	° ′ ″
Mar. 15 (7) P.	10 48 57.53	64 35 43.5
Div., Flex., etc.	. .	+ 0.03

B. A. C. 3763.

1877.	h. m. s.	° ′ ″
Jan. 30 S.	10 53 25.60	123 4 37.2
Feb. 20 P.	25.58	37.1
Mar. 15 (6) P.	25.50	39.0
Mean . . .	10 53 25.56	123 4 37.77
Div., Flex., etc.	. .	+ 0.38

LALANDE (F.) 1794.

1877.	h. m. s.	° ′ ″
Mar. 24 (7) P.	10 55 45.59	27 40 57.3
Div., Flex., etc.	. .	− 0.93

B. A. C. 3822.

1877.	h. m. s.	° ′ ″
Jan. 27 (7) P.	11 3 58.95	121 41 59.9
Feb. 28 P.	58.98	59.2
April 25 P.	58.84	60.1
Mean . . .	11 3 58.92	121 41 59.73
Div., Flex., etc.	. .	+ 0.41

B. A. C. 3851.

1877.	h. m. s.	° ′ ″
April 25 (4) P.	. . . . .	57 46 45.8
Div., Flex., etc. .	. . . . .	+ 0.10

B. A. C. 3851 (Ref.).

1877.	h. m. s.	° ′ ″
April 25 P.	. . . . .	57 46 45.6
Div., Flex., etc. .	. . . . .	+ 0.25

B. A. C. 3877.

1877.	h. m. s.	° ′ ″
April 14 E.	. . . . .	78 47 37.0
Div., Flex., etc. .	. . . . .	− 0.22

B. A. C. 3877 (Ref.).

1877.	h. m. s.	° ′ ″
April 14 E.	. . . . .	78 47 35.6
Div., Flex., etc. .	. . . . .	+ 0.39

B. A. C. 3890.

1877.	h. m. s.	° ′ ″
Jan. 27 (6) P.	11 19 31.92	125 23 16.1
Feb. 28 P.	31.84	17.2
Mean . . .	11 19 31.88	125 23 16.65
Div., Flex., etc.	. .	+ 0.42

B. A. C. 3891.

1877.	h. m. s.	° ′ ″
Mar. 24 P.	11 19 36.23	127 4 16.7
April 5 P.	36.08	17.3
Mean . . .	11 19 36.16	127 4 17.00
Div., Flex., etc.	. .	+ 0.48

B. A. C. 3906.

1877.	h. m. s.	° ′ ″
Feb. 20 P.	11 23 5.67	8 11 45.9
Mar. 15 P.	5.68	47.2
Mean . . .	11 23 5.68	8 11 46.55
Div., Flex., etc.	. .	− 1.17

TAYLOR 6170.

1877.	h. m. s.	° ′ ″
Jan. 27 (9.5) P.	11 25 14.16	134 17 22.9
Div., Flex., etc.	. .	+ 0.59

ANONYMOUS.

1877.	h. m. s.	° ′ ″
Apr. 5 (11 8) P.	11 26 40.92	81 39 4.5
25 P.	40.88	3.0
Mean . . .	11 26 40.90	81 39 3.75
Div., Flex., etc.	. .	− 0.12

B. A. C. 3934.

1877.	h. m. s.	° ′ ″
April 23 F.	11 28 30.94	122 10 48.3
Div., Flex., etc.	. .	+ 0.40

B. A. C. 3945.

1877.	h. m. s.	° ′ ″
Jan. 27 (7) P.	11 30 29.16	122 53 20.0
Div., Flex., etc.	. .	+ 0.38

B. A. C. 3948.

1877.	h. m. s.	° ′ ″
April 23 F.	11 31 55.30	122 18 19.6
Div., Flex., etc.	. .	+ 0.39

B. A. C. 3981.

1877.	h. m. s.	° ′ ″
Feb. 27 S.	11 39 33.07	41 32 17.8
Mar. 24 (4.5) P.	33.01	19.9
Mean . . .	11 39 33.04	41 32 18.85
Div., Flex., etc.	. .	− 0.80

B. A. C. 3981 (Ref.).

1877.	h. m. s.	° ′ ″
Mar. 24 P.	. . . . .	41 32 19.3
Div., Flex., etc.	. .	+ 1.09

TAYLOR 6304.

1877.	h. m. s.	° ′ ″
Mar. 15 (5.5) P.	11 40 39.36	129 49 51.3
April 23 F.	39.35	49.5
25 P.	39.40	52.9
Mean . . .	11 40 39.37	129 49 51.23
Div., Flex., etc.	. .	+ 0.53

B. A. C. 4002.

1877.	h. m. s.	° ′ ″
Mar. 7 S.	. . . . .	87 32 32.9
Div., Flex., etc.	. .	+ 0.15

B. A. C. 4002 (Ref.).

1877.	h. m. s.	° ′ ″
Mar. 7 S.	. . . . .	87 32 31.8
Div., Flex., etc.	. .	+ 0.50

B. A. C. 4079.

1877.	h. m. s.	° ′ ″
Mar. 15 (7.5) P.	12 0 53.82	79 39 9.2
23 S.	53.82	9.3
24 P.	53.84	9.0
Mean . . .	12 0 53.83	79 39 9.17
Div., Flex., etc.	. .	− 0.21

B. A. C. 4092.

1877.	h. m. s.	° ′ ″
May 14 S.	12 2 33.24	130 32 48.9
23 (6) P.	33.17	47.9
Mean . . .	12 2 33.20	130 32 48.40
Div., Flex., etc.	. .	+ 0.54

LALANDE 22954

1877.	h. m. s.	° ′ ″
April 7 F.	12 8 50.85	99 35 39.3
Div., Flex., etc.	. .	+ 0.07

B. A. C. 4123.

1877.	h. m. s.	° ′ ″
May 14 S.	. . . .	32 17 4.1
Div., Flex , etc.	. .	− 0.95

B. A. C. 4123 (Ref.).

1877.	h. m. s.	° ′ ″
May 14 S.	. . . . .	32 17 0.2
Div., Flex., etc.	. .	+ 1.43

γ CORVI.

1877.	h. m. s.	° ′ ″
Mar. 29 E.	12 9 28.95	106 51 32.9
Div., Flex., etc.	. .	+ 0.10

B. A. C. 4165.

1877.	h. m. s.	° ′ ″
Feb. 20 P.	12 14 18.95	1 37 6.8
April 25 (7) P.	20.47	7.7
May 23 (6.5) P.	18.69	7.8
29 (6.8) P.	21.34	. .
Mean . . .	12 14 19.86	1 37 7.4
Div., Flex., etc.	. .	− 1.

B. A. C. 4165, S. P.

1877.	h. m. s.	° ′ ″
July 30 (6.5) P.	12 14 19.61	358 22 54.5
Oct. 24 P.	19.64	54.1
Nov. 19 P.	18.08	54.3
Dec. 3 P.	19.61	54.7
Mean . . .	12 14 19.24	358 22 54.40
Div., Flex., etc.	. .	— 1.00

B. A. C. 4174.

1877.	h. m. s.	° ′ ″
Mar. 23 S.	12 17 7.71	124 43 48.9
Div., Flex., etc.	. .	+ 0.39

B. A. C. 4185.

1877.	h. m. s.	° ′ ″
Mar. 15 (6) P.	12 19 10.00	32 32 25.7
Div., Flex., etc.	. .	— 0.95

B. A. C. 4195.

1877.	h. m. s.	° ′ ″
Mar. 24 P.	. . . . .	61 2 52.7
May 14 S.	. .	53.4
Mean . . .	. . . . .	61 2 53.05
Div., Flex., etc.	. .	+ 0.12

B. A. C. 4195 (Ref.).

1877.	h. m. s.	° ′ ″
Mar. 24 P.	. . . . .	61 2 52.4
May 14 S.	. .	51.8
Mean . . .	. . . . .	61 2 52.10
Div., Flex., etc.	. .	+ 0.27

B. A. C. 4200.

1877.	h. m. s.	° ′ ″
April 14 E.	12 21 32.93	93 56 4.2
25 (6.8) P.	33.11	5.3
Mean . . .	12 21 33.02	93 56 4.75
Div., Flex., etc.	. .	+ 0.27

B. A. C. 4209.

1877.	h. m. s.	° ′ ″
April 11 F.	12 23 17.80	65 12 38.1
May 23 (5.8) P.	17.78	40.5
Mean . . .	12 23 17.79	65 12 39.30
Div., Flex., etc.	. .	+ 0.02

ANONYMOUS.

1877.	h. m. s.	° ′ ″
Mar. 30 F.	12 24 23.75	100 40 25.2
Div., Flex., etc.	. .	+ 0.12

B. A. C. 4225.

1877.	h. m. s.	° ′ ″
Mar. 15 (6.5) P.	12 25 19.31	94 22 26.6
April 11 F.	19.35	27.6
May 15 P.	19.33	27.8
Mean . . .	12 25 19.33	94 22 27.33
Div., Flex., etc.	. .	+ 0.26

f VIRGINIS.

1877.	h. m. s.	° ′ ″
Mar. 15 (6.5) P.	12 30 27.30	95 9 14.1
May 15 P.	27.30	14.5
Mean . . .	12 30 27.30	95 9 14.30
Div., Flex., etc.	. .	+ 0.23

WEISSE 498.

1877.	h. m. s.	° ′ ″
April 22 (9.0) E.	12 31 13.32	92 53 32.8
Div., Flex., etc.	. .	+ 0.25

B. A. C. 4268^1.

1877.	h. m. s.	° ′ ″
Mar. 23 S.	. . . . .	90 46 32.3
Div., Flex., etc.	. .	+ 0.16

B. A. C. 4268^1 (Ref.).

1877.	h. m. s.	° ′ ″
Mar. 23 S.	. . . . .	90 46 31.9
Div., Flex., etc.	. .	+ 0.48

LALANDE 23951.

1877.	h. m. s.	° ′ ″
April 11 F.	12 45 1.53	102 48 39.5
23 F.	1.48	38.4
May 15 P.	1.59	38.6
Mean . . .	12 45 1.53	102 48 38.83
Div., Flex., etc.	. .	+ 0.16

32^1 CAMELOPARDALIS.

1877.	h. m. s.	° ′ ″
Mar. 15 P.	12 48 6.65	5 54 48.8
April 25 P.	6.65	50.1
May 23 P.	6.31	46.0
Mean . . .	12 48 6.54	5 54 48.30
Div., Flex., etc.	. .	— 1.03

32^1 CAMELOPARDALIS, S. P.

1877.	h. m. s.	° ′ ″
Sept. 26 P.	12 48 6.83	354 5 13.3
Oct. 6 F.	6.11	12.8
15 E.	6.95	12.4
Nov. 19 P.	5.85	13.4
Dec. 14 E.	7.23	13.3
Mean . . .	12 48 6.59	354 5 13.04
Div., Flex., etc.	. .	— 1.04

12^1 CANUM VENATICORUM.

1877.	h. m. s.	° ′ ″
Mar. 7 S.	12 50 15.09	51 1 16.2
23 S.	15.04	16.1
29 E.	14.96	15.8
April 22 E.	14.88	16.5
May 14 S.	15.11	16.3
17 (5) F.	15.15	16.0
22 S.	15.09	15.9
June 19 S.	14.96	17.3
Mean . . .	12 50 15.04	51 1 16.26
Div., Flex., etc.	. .	— 0.21

B. A. C. 4340.

1877.	h. m. s.	° ′ ″
Sept. 10 F.	. . . . .	85 54 44.8
Div., Flex., etc.	. .	+ 0.11

B. A. C. 4355.

1877.	h. m. s.	° ′ ″
April 23 F.	12 53 48.80	122 50 21.7
May 14 S.	48.95	21.0
Mean . . .	12 53 48.88	122 50 21.35
Div., Flex., etc.	. .	+ 0.38

B. A. C. 4357^1.

1877.	h. m. s.	° ′ ″
April 23 F.	12 54 17.75	122 57 38.9
May 14 S.	18.03	40.4
Mean . . .	12 54 17.89	122 57 39.65
Div., Flex., etc.	. .	+ 0.38

B. A. C. 4357^2.

1877.	h. m. s.	° ′ ″
April 23 F.	12 54 18.45	122 57 35.5
May 14 S.	18.50	36.0
Mean . . .	12 54 18.48	122 57 35.75
Div., Flex., etc.	. .	+ 0.38

B. A. C. 4367.

1877.	h. m. s.	° ′ ″
Mar. 24 P.	12 56 3.23	78 22 46.5
Nov. 11 E.	3.20	44.3
Mean . . .	12 56 3.22	78 22 45.40
Div., Flex., etc.	. .	— 0.22

50 VIRGINIS.

1877.	h. m. s.	° ′ ″
April 23 F.	13 3 19.05	99 40 21.5
May 22 S.	19.24	23.2
Mean . . .	13 3 19.14	99 40 22.35
Div., Flex., etc.	. .	+ 0.08

B. A. C. 4389.

1877.	h. m. s.	° ′ ″
Feb. 29 P.	13 0 20.06	44 4 23.8
Mar. 15 (6) P.	20.06	24.6
May 23 (6.2) P.	20.03	25.1
Mean . . .	13 0 20.05	44 4 24.50
Div., Flex., etc.	. .	— 0.77

B. A. C. 4417.

1877.	h. m. s.	° ′ ″
Mar. 15 (5.2) P.	13 5 11.91	127 9 1.8
April 5 P.	12.10	1.3
23 F.	11.79	2.3
Mean . . .	13 5 11.93	127 9 1.8
Div., Flex., etc.	. .	+ 0.4

DURCH. 7°, 2641.

1877.	h. m. s.	° ′ ″
May 14 S.	13 18 33.05	82 39 29.6
Div., Flex., etc.	. .	— 0.

DURCH. 8°, 2710.

1877.	h. m. s.	° ′ ″
May 23 (9.8) P.	13 20 16.69	81 57 37
Div., Flex., etc.	. .	—

B. A. C. 4509.

1877.	h. m. s.	° ′ ″
Mar. 15 (7.5) P.	13 24 4.45	70 18 21.3
May 1 (6.5) F.	. .	21.2
12 (7.5) E.	4.28	22.0
15 P.	4.51	22.5
23 (7.8) P.	4.48	21.0
Mean . . .	13 24 4.43	70 18 21.60
Div., Flex., etc.	. .	− 0.15

B. A. C. 4545.

1877.	h. m. s.	° ′ ″
Feb. 20 P.	13 29 59.88	45 10 25.4
May 12 (6.5) E.	59.69	26.9
Mean . . .	13 29 59.78	45 10 26.15
Div, Flex., etc.	. .	− 0.76

B. A. C. 4553.

1877.	h. m. s.	° ′ ″
May 28 E.	13 32 12.08	66 50 36.9
Div., Flex., etc.	. .	− 0.05

DURCH. 25°, 2658.

1877.	h. m. s.	° ′ ″
May 28 (9.0) E.	13 31 59.36	64 50 50.6
Div., Flex., etc.	. .	+ 0.02

B. A. C. 4562.

1877.	h. m. s.	° ′ ″
Feb. 20 P.	13 34 48.05	69 25 17.8
Mar. 15 (6.2) P.	47.98	18.3
May 15 P.	48.01	18.7
23 (6.2) P.	47.98	18.7
Mean . . .	13 34 48.00	69 25 18.38
Div., Flex., etc.	. .	− 0.14

B. A. C. 4563.

1877.	h. m. s.	° ′ ″
Feb. 20 P.	13 34 48.49	69 21 49.9
Mar. 15 (7.5) P.	48.47	49.6
May 15 P.	48.50	51.1
23 (7.8) P.	48.39	49.8
Mean . . .	13 34 48.46	69 21 50.10
Div., Flex., etc.	. .	− 0.14

B. A. C. 4568.

1877.	h. m. s.	° ′ ″
June 1 E.	13 36 4.36	34 41 45.3
Div., Flex., etc.	. .	− 0.96

B. A. C. 4568 (Ref.).

1877.	h. m. s.	° ′ ″
June 1 E.	. . . . .	34 41 43.0
Div., Flex., etc.	. .	+ 1.35

B. A. C. 4595.

1877.	h. m. s.	° ′ ″
Mar. 15 (6.5) P.	13 40 59.41	50 52 47.8
May 18 S.	59.33	48.6
23 (6.5) P.	59.30	48.6
Mean . . .	13 40 59.35	50 52 48.33
Div., Flex., etc.	. .	− 0.22

B. A. C. 4600.

1877.	h. m. s.	° ′ ″
Mar. 15 (6) P.	13 41 41.42	50 50 29.8
May 18 S.	41.47	30.7
23 (6.0) P.	41.35	30.7
Mean . . .	13 41 41.41	50 50 30.40
Div., Flex., etc.	. .	− 0.22

B. A. C. 4643.

1877.	h. m. s.	° ′ ″
May 29 (6.5) P.	13 45 55.39	. . . .

B. A. C. 4643, S. P.

1877.	h. m. s.	° ′ ″
Nov. 19 P.	13 45 55.37	353 22 10.0
Div., Flex., etc.	. .	− 1.09

B. A. C. 4629^1.

1877.	h. m. s.	° ′ ″
June 1 (9.0) E.	13 46 7.97	121 19 25.6
Div., Flex, etc.	. .	+ 0.41

B. A. C. 4629^2.

1877.	h. m. s.	° ′ ″
June 1 (5.5) E.	13 46 8.12	121 19 9.8
Div., Flex., etc.	. .	+ 0.41

B. A. C. 4672.

1877.	h. m. s.	° ′ ″
May 2 S.	. . . . .	87 51 31.4
Div., Flex., etc.	. .	+ 0.15

B. A. C. 4672 (Ref.).

1877.	h. m. s.	° ′ ″
May 2 S.	. . . . .	87 51 33.4
Div., Flex., etc.	. .	+ 0.49

B. A. C. 4674.

1877.	h. m. s.	° ′ ″
Mar. 15 (6.5) P.	13 55 53.56	121 5 34.6
May 1 F.	53.58	32.3
22 S.	53.51	34.7
Mean . . .	13 55 53.55	121 5 33.87
Div., Flex., etc.	. .	+ 0.42

B. A. C. 4686.

1877.	h. m. s.	° ′ ″
April 25 (3) P.	13 59 26.92	125 45 50.5
June 20 P.	26.90	. .
Mean . . .	13 59 26.91	125 45 50.5
Div., Flex., etc	. .	+ 0.43

Lalande 26003.

1877.	h. m. s.	° ′ ″
April 25 (8) P.	14 5 11.32	102 1 31.6
Div., Flex., etc.	. .	+ 0.15

B. A. C. 4737.

1877.	h. m. s.	° ′ ″
April 25 (6.5) P.	14 11 35.66	74 10 0.8
May 22 S.	35.67	2.2
Mean . . .	14 11 35.66	74 10 1.50
Div., Flex., etc	. .	− 0.20

Groombridge 2097.

1877.	h. m. s.	° ′ ″
May 22 S.	14 13 52.38	50 39 46.8
Div., Flex., etc.	. .	− 0.24

B. A. C. 4758.

1877.	h. m. s.	° ′ ″
May 22 S.	14 14 44.67	50 38 24.9
Div., Flex., etc.	. .	− 0.24

B. A. C. 4759.

1877.	h. m. s.	° ′ ″
May 1 F.	14 15 27.85	128 56 55.4
Div., Flex., etc.	. .	+ 0.52

B. A. C. 4778.

1877.	h. m. s.	° ′ ″
April 25 (8) P.	14 18 23.04	52 14 8.4
Div., Flex., etc.	. .	− 0.04

φ Bootis.

1877.	h. m. s.	° ′ ″
Mar. 15 P.	14 26 31.71	59 5 17.5
June 23 S.	. .	17.3
Nov. 18 P.	31.76	16.7
Mean . . .	14 26 31.74	59 5 17.17
Div., Flex., etc.	. .	+ 0.07

φ Bootis (Ref.).

1877.	h. m. s.	° ′ ″
June 23 S.	. . . . .	59 5 16.2
Div., Flex., etc.	. .	+ 0.26

B. A. C. 4818.

1877.	h. m. s.	° ′ ″
May 18 S.	14 29 1.08	129 40 24.3
22 S.	1.34	24.7
Mean . . .	14 29 1.21	129 40 24.50
Div., Flex., etc.	. .	+ 0.53

ANONYMOUS.

1877.	h. m. s.	° ′ ″
Apr. 25 (10.5) P.	14 30 46.66	111 30 21.9
May 24 (9.5) E	46.70	24.5
Mean . . .	14 30 46.68	111 30 23.20
Div., Flex., etc.	. .	+ 0.24

B. A. C. 4870.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	14 38 58.02	49 1 10.2
May 22 S.	58.09	11.4
Mean . . .	14 38 58.06	49 1 10.80
Div., Flex., etc.	. .	− 0.38

B. A. C. 4903.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	14 44 . .	43 22 14.1
April 25 P.	55.74	14.8
May 22 S.	55.56	. .
Mean . . .	14 44 55.65	43 22 14.45
Div., Flex., etc.	. .	− 0.78

B. A. C. 4905^2.

1877.	h. m. s.	° ′ ″
Mar. 15 P.	. . . . .	70 23 15.7
May 23 P.	. .	16.6
Mean . . .	. . . . .	70 23 16.15
Div., Flex., etc.	. .	− 0.15

B. A. C. 4905^2 (Ref.).

1877.	h. m. s.	° ′ ″
Mar. 15 P.	. . . . .	70 23 16 9
May 23 P.	. .	16.2
Mean . . .	. . . . .	70 23 16.55
Div., Flex., etc.	. .	+ 0.35

B. A. C. 4967.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	14 58 . .	29 18 43.0
April 25 (6.5) P.	34.42	42.9
May 18 S.	34.51	44.4
Mean . . .	14 58 34.46	29 18 43.43
Div., Flex., etc.	. .	− 0.93

B. A. C. 4982.

1877.	h. m. s.	° ′ ″
May 23 (6.0) P.	14 58 43.96	6 59 5.6
Div., Flex., etc.	. .	− 1.11

B. A. C. 4982, S. P.

1877.	h. m. s.	° ′ ″
Dec. 3 (5.8) P.	14 58 44.87	353 0 57.2
Div., Flex., etc.	. .	− 1.12

B. A. C. 5017.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 7 58.96	131 1 58.2
May 1 F.	58.83	57.6
24 E.	58.84	58.1
Mean . . .	15 7 58.88	131 1 57.97
Div., Flex., etc.	. .	+ 0.55

B. A. C. 5035.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 10 52.88	130 20 (5.3)
May 18 S.	52.86	9.3
23 (5.8) P.	52.85	10.4
Mean . . .	15 10 52.86	130 20 9.85
Div., Flex., etc.	. .	+ 0.54

B. A. C. 5046.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 13 18.32	130 12 0.9
May 18 S.	18.24	5.7
23 (3.5) P.	18.29	1.2
Mean . . .	15 13 18.28	130 12 2.60
Div., Flex., etc.	. .	+ 0.53

Lacaille 6328.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 13 30.94	130 18 10 5
May 18 S.	30.75	12.4
23 (7) P.	30.85	9.3
Mean . . .	15 13 30.85	130 18 10.73
Div., Flex., etc.	. .	+ 0.54

B. A. C. 5054.

1877.	h. m. s.	° ′ ″
May 24 E.	15 14 0.39	125 48 50.5
June 1 E.	0.31	49.0
Mean . . .	15 14 0.35	125 48 49.75
Div., Flex., etc.	. .	+ 0.43

B. A. C. 5069.

1877.	h. m. s.	° ′ ″
May 24 E.	15 17 21.95	126 17 46.0
June 1 E.	21.98	47.7
Mean . . .	15 17 21.96	128 17 46.85
Div., Flex., etc.	. .	+ 0.50

μ^2 Bootis.

1877.	h. m. s.	° ′ ″
May 14 S.	15 19 51.95	52 13 14.0
Div., Flex., etc.	. .	− 0.05

B. A. C. 5092.

1877.	h. m. s.	° ′ ″
June 1 E.	15 21 8.68	42 30 19.2
Div., Flex., etc.	. .	− 0.79

B. A. C. 5135^1.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 28 55.67	79 3 1.0
May 23 (6) P.	55.57	0.1
June 1 (7.5) E.	55.54	0.2
Mean . . .	15 28 55.59	79 3 0.43
Div., Flex., etc.	. .	− 0.22

B. A. C. 5135^2.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 28 55.76	79 2 57.9
May 23 (5.2) P.	55.60	56.7
June 1 (5.0) E.	55.63	57.3
Mean . . .	15 28 55.66	79 2 57.30
Div., Flex., etc.	. .	− 0.22

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1877.	h. m. s.	° ′ ″
May 15 (7) P.	15 29 43.89	116 5 1.4
Div., Flex., etc.	. .	+ 0.37

B. A. C. 5164.

1877.	h. m. s.	° ′ ″
June 23 S.	15 31 33.39	39 53 35.9
Div., Flex., etc.	. .	− 0.83

B. A. C. 5199.

1877.	h. m. s.	° ′ ′
Mar. 15 (6) P.	15 38 53.08	124 17 43.9
May 15 P.	53.20	44.7
24 E.	53.18	46.0
Mean . . .	15 38 53.15	124 17 44.87
Div., Flex., etc.	. .	+ 0.39

B. A. C. 5216.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	. . . . .	74 11 31.4
Div., Flex., etc.	. .	− 0.20

B. A. C. 5216 (Ref.).

1877.	h. m. s.	° ′ ″
Feb. 7 S.	. . . . .	74 11 32.3
Div., Flex., etc.	. .	+ 0.33

O. Arg. N. 15653.

1877.	h. m. s.	° ′ ″
May 24 E.	15 43 38.76	34 8 54.3
June 1 E.	38.59	53 5
Mean . . .	15 43 38.68	34 8 53.90
Div., Flex., etc.	. .	− 0.97

O. Arg. N. 15662.

1877.	h. m. s.	° ′ ″
June 1 E.	15 44 15.34	34 13 48.5
Div., Flex., etc.	. .	− 0.97

B. A. C. 5248.

1877.	h. m. s.	° ′ ″
May 24 E.	15 44 39.77	34 14 47.8
June 1 E.	39.88	47.3
Mean . . .	15 44 39.82	34 14 47.55
Div., Flex., etc.	. .	− 0.96

B. A. C. 5261.

1877.	h. m. s.	° ′ ″
June 23 S.	15 47 48.83	120 43 15.4
Div., Flex., etc.	. .	+ 0.42

O. Arg. S. 15068.

1877.	h. m. s.	° ′ ″
June 23 S.	15 51 12.39	115 7 36.5
Div., Flex., etc.	. .	+ 0.35

B. A. C. 5311.

1877.	h. m. s.	° ′ ″
May 24 E.	15 55 13.55	128 15 27.0
Div., Flex., etc.	. .	+ 0.50

B. A. C. 5352.

1877.	h. m. s.	° ′ ″
May 15 P.	15 56 19.16	6 41 4.0
Div., Flex., etc.	. .	− 1.09

B. A. C. 5352, S. P.

1877.	h. m. s.	° ′ ″
Jan. 24 E.	15 56 19.77	353 18 56.2
Dec. 3 (8) P.	19.31	57.7
14 E.	19.40	57.1
Mean . . .	15 56 19.49	353 18 57.00
Div., Flex., etc.	. .	− 1.10

β^2 Scorpii.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	15 58 17.60	109 27 48.7
Mar. 15 P.	17.60	49.8
Mean . . .	15 58 17 60	109 27 49.25
Div., Flex., etc.	. .	+ 0.13

B. A. C. 5348.

1877.	h. m. s.	° ′ ″
June 11 S.	. . . . .	31 6 22.6
19 S.	. . . . .	22.3
Mean . . .	. . . .	31 6 22 45
Div., Flex., etc.	. .	− 0.92

B. A. C. 5348 (Ref.).

1877.	h.	m.	s.	°	′	″
June 11 S.	.	.	. . .	31	6	19.9
19 S.	.	.	. . .			19.8
Mean				31	6	19.85
Div., Flex., etc.			. .		+	1.47

B. A. C. 5355^1.

1877.	h.	m.	s.	°	′	″
May 28 E.	16	1	42.11	122	19	14.0
June 1 E.			42.00			. .
Mean . . .	16	1	42.06	122	19	14.0
Div., Flex., etc.			. .		+	0.39

B. A. C. 5355^2.

1877.	h.	m.	s.	°	′	″
May 28 E.	16	1	42.16	122	19	12.1
June 1 E.			42.70			. .
Mean . . .	16	1	42.68	122	19	12.1
Div., Flex., etc.			. .		+	0.39

B. A. C. 5395.

1877.	h.	m.	s.	°	′	″
June 1 E.	16	6	26.74	111	5	3.8
Div., Flex., etc.			. .		+	0.21

B. A. C. 5435^1.

1877.	h.	m.	s.	°	′	″
May 15 (8) P.	16	11	44.93	120	36	5.7
June 1 (7.5) E.			44.87			6.2
14 (8.0) F.			45.18			6.8
Mean . . .	16	11	44.99	120	36	6.23
Div., Flex., etc.			. .		+	0.42

B. A. C. 5435^2.

1877.	h.	m.	s.	°	′	″
May 15 (6) P.	16	11	46.08	120	36	23.3
June 1 (5.0) E.			45.98			24.0
14 (6.5) F.			46.29			23.6
Mean . . .	16	11	46.12	120	36	23.63
Div., Flex., etc.			. .		+	0.42

B. A. C. 5437^1.

1877.	h.	m.	s.	°	′	″
May 28 E.	.	.	. . .	94	23	29.1
Div., Flex., etc.			. .		+	0.26

B. A. C. 5437^1 (Ref.).

1877.	h.	m.	s.	°	′	″
May 28 E.	.	.	. . .	94	23	27.3
Div., Flex., etc.			. .		+	0.53

B. A. C. 5451.

1877.	h.	m.	s.	°	′	″
April 25 P.	16	14	57.07	127	7	51.1
May 18 (8.5) S.			57.03			51.4
June 22 F.			57.07			48.4
Mean . . .	16	14	57.06	127	7	50.30
Div., Flex., etc.			. .		+	0.48

B. A. C. 5466.

1877.	h.	m.	s.	°	′	″
June 19 S.	.	.	. . .	70	33	26.0
Div., Flex., etc.			. .		−	0.16

B. A. C. 5466 (Ref.).

1877.	h.	m.	s.	°	′	″
June 19 S.	.	.	. . .	70	33	24.4
Div., Flex., etc.			. .		+	0.34

β HERCULIS.

1877.	h.	m.	s.	°	′	″
April 25 P.	16	24	55.91	68	14	29.1
May 15 P.			55.86			29.2
Dec. 17 E.			. .			28.1
Mean . . .	16	24	55.88	68	14	28.80
Div., Flex., etc.			. .		−	0.12

β HERCULIS (Ref.).

1877.	h.	m.	s.	°	′	″
Dec. 17 E.	.	.	. . .	68	14	28.8
Div., Flex., etc.			. .		+	0.39

B. A. C. 5522.

1877.	h.	m.	s.	°	′	″
June 23 S.	16	25	11.27	121	17	17.7
Div., Flex., etc.			. .		+	0.41

B. A. C. 5583.

1877.	h.	m.	s.	°	′	″
June 1 E.	16	35	13.77	130	52	59.7
22 F.			13.87			55.3
28 (7) P.			13.83			57.1
Mean . . .	16	35	13.82	130	52	57.37
Div., Flex., etc.			. .		+	0.55

B. A. C. 5584.

1877.	h.	m.	s.	°	′	″
June 1 E.	16	35	22.07	130	52	40.8
22 F.			21.98			39.0
28 (7) P.			21.94			37.1
Mean . . .	16	35	22.00	130	52	38.97
Div., Flex., etc.			. .		+	0.55

XVI, 17.

1877.	h.	m.	s.	°	′	″
May 15 (6) P.	16	37	18.86	118	16	42.8
June 19 S.			18.68			41.5
Mean . . .	16	37	18.77	118	16	42.15
Div., Flex., etc.			. .		+	0.40

XVI, 18.

1877.	h.	m.	s.	°	′	″
July 6 (7.5) P.	16	37	33.80	123	37	5.1
Div., Flex., etc.			. .		+	0.38

B. A. C. 5604.

1877.	h.	m.	s.	°	′	″
Dec. 17 E.	16	37	38.91	58	10	24.2
Div., Flex., etc.			. .		+	0.09

XVI, 19.

1877.	h.	m.	s.	°	′	″
May 15 (7.5) P.	16	39	42.45	109	52	23.5
Div., Flex., etc.			. .		+	0.15

O. ARG. S. 15973.

1877.	h.	m.	s.	°	′	″
April 25 P.	16	41	21.55	115	17	17.7
Div., Flex., etc.			. .		+	0.36

O. ARG. S. 15981.

1877.	h.	m.	s.	°	′	″
April 25 P.	16	41	47.33	115	20	22.5
Div., Flex., etc.			. .		+	0.36

B. A. C. 5632.

1877.	h.	m.	s.	°	′	″
June 19 S.	16	42	11.72	124	4	5.1
Div., Flex., etc.			. .		+	0.38

B. A. C. 5643.

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	.	.	. . .	32	59	52.7
Div., Flex., etc.			. .		−	0.96

B. A. C. 5643 (Ref.).

1877.	h.	m.	s.	°	′	″
Feb. 7 S.	.	.	. . .	32	59	51.1
Div., Flex., etc.			. .		+	1.42

H. IV, 50.

1877.	h.	m.	s.	°	′	″
July 14 P.	16	43	31.35	42	15	14.2
30 P.			31.31			12.8
Mean . . .	16	43	31.33	42	15	13.50
Div., Flex., etc.			. .		−	0.79

B. A. C. 5671.

1877.	h.	m.	s.	°	′	″
May 15 (6.5) P.	16	46	45.23	120	22	59.6
June 22 F.			45.35			57.0
28 (6.8) P.			45.33			59.6
Mean . . .	16	46	45.32	120	22	58.73
Div., Flex., etc.			. . .		+	0.41

B. A. C. 5686.

1877.	h.	m.	s.	°	′	″
July 6 (8.2) P.	16	47	46.61	74	23	16.7
12 F.			46.54			16.0
Mean . . .	16	47	46.58	74	23	16.35
Div., Flex., etc.			. .		−	0.19

B. A. C. 5694.

1877.	h.	m.	s.	°	′	″
June 19 S.	16	49	0.59	122	8	19.2
July 12 F.			0.62			17.8
Mean . . .	16	49	0.60	122	8	18.50
Div., Flex., etc.			. .		+	0.40

WEISSE 958.

1877.	h.	m.	s.	°	′	″
May 24 E.	16	51	49.52	91	9	5.0
Div., Flex., etc.			. .		+	0.27

O. ARG. S. 16183^1.

1877.	h.	m.	s.	°	′	″
June 28 (9.8) P.	16	52	27.76	114	0	51.4
Div., Flex., etc.			. .		+	0.32

O. ARG. S. 16183^2.

1877.	h.	m.	s.	°	′	″
June 28 (10) P.	16	52	28.25	114	0	45.7
Div., Flex., etc.			. .		+	0.32

B. A. C. 5731.

1877.	h.	m.	s.	°	′	″
Dec. 17 E.	16	55	34.94	58	53	28.6
Div., Flex., etc.			. .		+	0.07

ANONYMOUS.

1877.	h. m. s.	° ′ ″
May 17 F.	16 56 57.92	94 37 2.7
Div., Flex., etc.	. .	+ 0.25

B. A. C. 5781.

1877.	h. m. s.	° ′ ″
Feb. 7 S.	17 3 19.43	105 34 14.3
June 14 F.	19.59	14.7
22 F.	19.46	14.3
29 F.	19.50	15.7
Mean . . .	17 3 19.50	105 34 14.75
Div., Flex., etc.	. .	+ 0.12

B. A. C. 5793.

1877.	h. m. s.	° ′ ″
July 6 (6.8) P.	17 4 58.91	122 17 14.1
30 (6.5) P.	58.94	11.4
Mean . . .	17 4 58.92	122 17 12.75
Div., Flex., etc.	. .	+ 0.39

a^2 HERCULIS.

1877.	h. m. s.	° ′ ″
June 29 F.	17 9 2.68	75 28 8.3
Div., Flex., etc.	. .	− 0.17

B. A. C. 5825.

1877.	h. m. s.	° ′ ″
June 28 (6.5) P.	17 10 35.06	124 50 57.9
Div., Flex., etc.	. .	+ 0.40

ANONYMOUS.

1877.	h. m. s.	° ′ ″
June 28 (10) P.	17 16 21.50	87 20 19.2
July 12 F.	21.52	21.0
30 (10.2) P.	21.39	18.2
Mean . . .	17 16 21.47	87 20 19.47
Div., Flex., etc.	. .	+ 0.14

ANONYMOUS.

1877.	h. m. s.	° ′ ″
June 28 (10.5) P.	17 16 27.25	87 22 45.9
July 12 F.	27.28	46.6
30 (10.5) P.	27.35	46.6
Mean . . .	17 16 27.29	87 22 46.37
Div., Flex., etc.	. .	+ 0.14

LALANDE 31762.

1877.	h. m. s.	° ′ ″
June 29 F.	17 19 55.41	52 57 54.2
Div., Flex., etc.	. .	+ 0.07

B. A. C. 5895.

1877.	h. m. s.	° ′ ″
June 29 F.	17 20 11.63	52 56 14.7
Div., Flex., etc.	. .	+ 0.06

DURCH. 16°, 3211¹.

1877.	h. m. s.	° ′ ″
June 28 (10) P.	17 26 31.84	73 35 49.1
July 30 (10) P.	31.83	50.0
Mean . . .	17 26 31.84	73 35 49.55
Div., Flex., etc.	. .	− 0.20

DURCH. 16°, 3211².

1877.	h. m. s.	° ′ ″
June 28 (9.2) P.	17 26 32.68	73 35 36.2
July 30 (9.5) P.	32.68	37.2
Mean . . .	17 26 32.68	73 35 36.70
Div., Flex., etc.	. .	− 0.20

WEISSE (2) 817.

1877.	h. m. s.	° ′ ″
June 28 (5.8) P.	17 28 9.32	73 35 37.9
29 F.	9.23	38.1
July 7 E.	9.31	38.5
30 (6.2) P.	9.27	38.9
Mean . . .	17 28 9.28	73 35 38.35
Div., Flex., etc.	. .	− 0.20

XVII, 10.

1877.	h. m. s.	° ′ ″
May 31 (9.5) P.	17 29 55.46	120 49 52.1
July 6 (8.5) P.	55.47	52.7
Mean . . .	17 29 55.46	120 49 52.40
Div., Flex., etc.	. .	+ 0.42

DURCH. 22°, 3173.

1877.	h. m. s.	° ′ ″
July 6 (9.5) P.	17 33 1.66	67 54 55.5
Div., Flex., etc.	. .	− 0.11

ANONYMOUS.

1877.	h. m. s.	° ′ ″
June 23 S.	17 37 25.48	118 16 10.4
Div., Flex., etc.	. .	+ 0.40

O. ARG. S. 17137.

1877.	h. m. s.	° ′ ″
June 22 F.	17 37 3.77	117 10 17.0
July 7 E.	3.69	18.1
30 P.	3.70	. .
Mean . . .	17 37 3.72	117 10 17.55
Div., Flex., etc.	. .	+ 0.38

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 30 (10.5) P.	17 37 9.84	. . . .

O. ARG. S. 17166.

1877.	h. m. s.	° ′ ″
June 22 F.	17 38 8.37	117 9 43.1
July 7 E.	8.41	46.5
30 P.	8.28	. .
Mean . . .	17 38 8.35	117 9 44.80
Div., Flex., etc.	. .	+ 0.38

XVII, 16.

1877.	h. m. s.	° ′ ″
July 6 (7.8) P.	17 40 11.05	110 47 20.0
Div., Flex., etc.	. .	+ 0.20

XVII, 19.

1877.	h. m. s.	° ′ ″
July 6 (8.5) P.	17 43 22.79	126 25 49.6
Div., Flex., etc.	. .	+ 0.46

ψ^2 DRACONIS.

1877.	h. m. s.	° ′ ″
June 25 (7) P.	17 44 9.52	17 46 59.7
29 F.	9.87	59.5
Mean . . .	17 44 9.70	17 46 59.60
Div., Flex., etc.	. .	− 1.19

ψ^2 DRACONIS, S. P.

1877.	h. m. s.	° ′ ″
Jan. 28 E.	17 44 9.36	342 13 4.0
Dec. 3 P.	9.49	0.5
Mean . . .	17 44 9.42	342 13 2.25
Div., Flex., etc.	. .	− 1.22

B. A. C. 6072.

1877.	h. m. s.	° ′ ″
May 28 E.	17 50 51.07	118 44 36.0
July 30 (6) P.	50.96	36.9
Mean . . .	17 50 51.02	118 44 36.45
Div., Flex., etc.	. .	+ 0.41

B. A. C. 6103.

1877.	h. m. s.	° ′ ″
July 7 E.	17 56 33.28	125 54 9.1
Div., Flex., etc.	. .	+ 0.44

B. A. C. 6117.

1877.	h. m. s.	° ′ ″
July 7 E.	17 58 4.96	126 1 37.1
Div., Flex., etc.	. .	+ 0.44

B. A. C. 6145.

1877.	h. m. s.	° ′ ″
July 7 E.	18 2 9.71	120 44 44.4
Div., Flex., etc.	. .	+ 0.42

B. A. C. 6166.

1877.	h. m. s.	° ′ ″
July 6 (7.2) P.	18 5 36.73	121 59 45.7
Div., Flex., etc.	. .	+ 0.40

B. A. C. 6275.

1877.	h. m. s.	° ′ ″
Aug. 18 F.	18 21 57.13	123 7 31.2
Div., Flex., etc.	. .	+ 0.38

B. A. C. 6285.

1877.	h. m. s.	° ′ ″
July 7 E.	18 23 0.91	123 4 7.7
Aug. 18 F.	0.78	5.6
Mean . . .	18 23 0.84	123 4 6.65
Div., Flex., etc.	. .	+ 0.38

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 7 E.	18 24 19.88	123 1 23.4
Aug. 18 F.	19.82	24.7
Mean . . .	18 24 19.85	123 1 24.05
Div., Flex., etc.	. .	+ 0.38

B. A. C. 6298¹ (N.).

1877.	h. m. s.	° ′ ″
July 30 (7) P.	18 24 54.13	128 48 23.9
Div., Flex., etc.	. .	+ 0.51

B. A. C. 6298^2 (S.).

1877.	h. m. s.	° ′ ″
July 30 (6.5) P.	18 24 54.17	128 48 44.7
Div., Flex., etc.	. .	+ 0.51

B. A. C. 6305.

1877.	h. m. s.	° ′ ″
Aug. 18 F.	18 25 53.80	123 7 35.1
Div., Flex., etc.	. .	+ 0.38

B. A. C. 6308.

1877.	h. m. s.	° ′ ″
Aug. 18 F.	18 26 1.41	123 3 17.8
Div., Flex., etc.	. .	+ 0.38

B. A. C. 6317.

1877.	h. m. s.	° ′ ″
July 7 E.	18 27 23.08	122 59 4.9
Div., Flex., etc.	. .	+ 0.38

O. ARG. S. 18436.

1877.	h. m. s.	° ′ ″
May 15 P.	18 29 14.83	117 49 41.4
Div., Flex., etc.	. .	+ 0.40

ANONYMOUS.

1877.	h. m. s.	° ′ ″
May 31 P.	18 29 33.78	117 23 23.1
June 25 (9.5) P.	33.95	22.3
Mean . . .	18 29 33.86	117 23 22.70
Div., Flex., etc.	. .	+ 0.39

B. A. C. 6344.

1877.	h. m. s.	° ′ ″
July 7 E.	18 31 26.81	123 5 58.5
Aug. 18 F.	26.83	58.3
Mean . . .	18 31 26.82	123 5 58.40
Div., Flex., etc.	. .	+ 0.38

B. A. C. 6487.

1877.	h. m. s.	° ′ ″
Jan. 28 F.	18 54 2.40	75 5 49.8
Div., Flex., etc.	. .	− 0.18

B. A. C. 6491.

1877.	h. m. s.	° ′ ″
Jan. 30 E.	18 54 20.63	57 28 41.7
Div., Flex., etc.	. .	+ 0.12

B. A. C. 6520.

1877.	h. m. s.	° ′ ″
July 30 (5.8) P.	18 57 57.65	43 14 20.3
Div., Flex., etc.	. .	− 0.78

DURCH. 21°, 3702.

1877.	h. m. s.	° ′ ″
July 7 F.	19 8 52.32	68 49 9.4
Div., Flex., etc.	. .	− 0.13

B. A. C. 6681.

1877.	h. m. s.	° ′ ″
July 6 (6.8) P.	19 23 33.26	32 13 13.6
Div., Flex., etc.	. .	− 0.94

B. A. C. 6690.

1877.	h. m. s.	° ′ ″
Jan. 28 F.	19 25 45.65	62 17 50.4
Feb. 15 P.	. .	51.2
20 E.	45.57	52.3
July 7 E.	. .	52.1
26 (3) P.	45.64	51.3
Dec. 18 E.	45.67	52.0
Mean . . .	19 25 45.63	62 17 51.55
Div., Flex., etc.	. .	+ 0.09

B. A. C. 6690 (Ref.).

1877.	h. m. s.	° ′ ″
Feb. 15 P.	. . . . .	62 17 51.8
July 7 E.	. .	52.6
Mean . . .	. . . . .	62 17 52.20
Div., Flex., etc.	. .	+ 0.28

B. A. C. 6691.

1877.	h. m. s.	° ′ ″
July 26 (7) P.	19 26 47.75	62 17 32.3
Div., Flex., etc.	. .	+ 0.09

ANONYMOUS.

1877.	h. m. s.	° ′ ″
June 29 F.	19 27 55.91	116 39 57.4
Div., Flex., etc.	. .	+ 0.38

MURAL ZONES 176, 77.

1877.	h. m. s.	° ′ ″
June 29 F.	19 28 20.09	116 34 6.4
Div., Flex., etc.	. .	+ 0.38

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 30 (10.2) P.	19 30 1.85	116 31 12.1
Div., Flex., etc.	. .	+ 0.38

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 30 (9.8) P.	19 30 52.72	116 38 23.3
Div., Flex., etc.	. .	+ 0.38

B. A. C. 6734.

1877.	h. m. s.	° ′ ″
Feb. 7 P.	19 33 8.55	40 3 48.3
Dec. 14 E.	8.63	46.7
18 E.	8.58	46.0
Mean . . .	19 33 8.59	40 3 47.00
Div., Flex., etc.	. .	− 0.83

B. A. C. 6734 (Ref.).

1877.	h. m. s.	° ′ ″
Feb. 7 P.	. . . . .	40 3 47.2
Div., Flex., etc.	. .	+ 1.12

B. A. C. 6763^1.

1877.	h. m. s.	° ′ ″
July 6 (6.2) P.	19 38 32.79	39 45 35.1
30 P.	32.77	35.3
Mean . . .	19 38 32.78	39 45 35.20
Div., Flex., etc.	. .	− 0.83

B. A. C. 6763^2.

1877.	h. m. s.	° ′ ″
July 6 (6.5) P.	19 38 35.61	39 46 2.7
30 P.	35.50	2.1
Mean . . .	19 38 35.56	39 46 2.40
Div., Flex., etc.	. .	− 0.83

B. A. C. 6905.

1877.	h. m. s.	° ′ ″
Aug. 28 E.	. . . . .	25 31 25.0
Div., Flex., etc.	. .	− 0.96

B. A. C. 6905 (Ref.).

1877.	h. m. s.	° ′ ″
Aug. 28 E.	. . . . .	25 31 22.9
Div., Flex., etc.	. .	+ 1.53

B. A. C. 6930.

1877.	h. m. s.	° ′ ″
Sept. 26 (6) P.	20 3 11.70	26 27 49.8
Div., Flex., etc.	. .	− 0.95

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 30 (11.5) P.	20 4 49.17	117 25 33.1
Div., Flex., etc.	. .	+ 0.39

B. A. C. 6934.

1877.	h. m. s.	° ′ ″
Feb. 9 F.	20 4 57.53	91 11 3.9
Div., Flex., etc.	. .	+ 0.17

O. ARG. S. 20345.

1877.	h. m. s.	° ′ ″
Aug. 28 E.	20 8 28.08	105 9 15.5
Sept. 21 F.	28.23	15.2
22 F.	28.23	16.1
26 P.	28.16	15.1
Oct. 5 S.	28.23	15.5
Mean . . .	20 8 28.19	105 9 15.48
Div., Flex., etc.	. .	+ 0.13

O. ARG. S. 20392.

1877.	h. m. s.	° ′ ″
Aug. 28 E.	20 12 8.80	104 40 24.2
Sept. 21 F.	8.93	24.6
22 F.	8.85	24.5
Oct. 5 S.	. .	23.4
Mean . . .	20 12 8.86	104 40 24.18
Div., Flex., etc.	. .	+ 0.14

O. ARG. S. 20407.

1877.	h. m. s.	° ′ ″
Oct. 1 F.	20 12 57.92	105 24 1.2
12 F.	57.73	2.1
Mean . . .	20 12 57.82	105 24 1.65
Div., Flex., etc.	. .	+ 0.12

LALANDE 39140.

1877.	h. m. s.	° ′ ″
Aug. 28 E.	20 16 33.39	104 38 58.2
Sept. 21 F.	33.52	57.6
22 F.	33.50	57.1
Oct. 5 S.	32.47	57.5
Mean . . .	20 16 33.22	104 38 57.60
Div., Flex., etc.	. .	+ 0.14

γ CYGNI.

1877.	h. m. s.	° ′ ″
Feb. 7 P.	20 17 48.89	50 8 10.1
9 F.	48.94	9.4
15 P.	48.84	12.9
28 E.	48.99	9.2
Mean . . .	20 17 48.92	50 8 10.40
Div., Flex., etc.	. .	− 0.29

LALANDE 39210.

1877.	h. m. s.	° ′ ″
Sept. 26 P.	20 18 24.67	105 12 59.1
Oct. 1 F.	24.77	58.6
5 S.	. .	56.2
12 F.	24.71	58.0
Mean . . .	20 18 24.72	105 12 57.98
Div., Flex., etc.	. .	+ 0.13

B. A. C. 7029.

1877.	h. m. s.	° ′ ″
July 6 P.	. . . . .	58 12 22.6
Div., Flex., etc.	. .	+ 0.09

B. A. C. 7029 (Ref.).

1877.	h. m. s.	° ′ ″
July 6 P.	. . . . .	58 12 21.9
Div., Flex., etc.	. .	+ 0.25

LALANDE 39247.

1877.	h. m. s.	° ′ ″
Aug. 28 E.	20 19 10.06	105 22 45.4
Sept. 21 F.	10.16	46.3
Oct. 1 F.	. .	45.4
Mean . . .	20 19 10.11	105 22 45.70
Div., Flex., etc.	. .	+ 0.12

O. ARG. S. 20541.

1877.	h. m. s.	° ′ ″
Oct. 5 S.	20 22 . .	105 27 58.7
12 F.	8.52	59.6
Mean . . .	20 22 8.52	105 27 59.15
Div., Flex., etc.	. .	+ 0.12

LALANDE 39486.

1877.	h. m. s.	° ′ ″
Aug. 28 E.	20 25 1.94	104 11 22.1
Sept. 21 F.	2.01	20.8
Oct. 5 S.	. .	20.8
6 F.	2.13	23.4
Mean . . .	20 25 2.03	104 11 21.78
Div., Flex., etc.	. .	+ 0.15

B. A. C. 7077.

1877.	h. m. s.	° ′ ″
May 31 P.	20 25 32.90	115 21 27.4
July 6 (6.5) P.	32.82	27.2
Mean . . .	20 25 32.86	115 21 27.30
Div., Flex., etc.	. .	+ 0.36

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 6 (10) P.	20 25 49.07	115 24 22.8
Div., Flex., etc.	. .	+ 0.36

ANONYMOUS.

1877.	h. m. s.	° ′ ″
July 6 (10) P.	20 26 52.87	115 27 31.6
Div., Flex., etc.	. .	+ 0.36

LALANDE 39579.

1877.	h. m. s.	° ′ ″
Oct. 1 F.	20 27 21.08	104 8 31.3
12 F.	20.98	32.3
Mean . . .	20 27 21.03	104 8 31.80
Div., Flex., etc.	. .	+ 0.15

WEISSE 664.

1877.	h. m. s.	° ′ ″
Oct. 1 F.	20 27 53.48	104 51 42.3
5 S.	. .	43.5
6 F.	53.57	44.5
Mean . . .	20 27 53.52	104 51 43.43
Div., Flex., etc.	. .	+ 0.13

LALANDE 39671^1.

1877.	h. m. s.	° ′ ″
Aug. 28 (8.5) E.	20 29 24.41	105 44 1.5
Sept. 21 F.	24.49	2.8
22 F.	24.52	0.4
26 P.	24.49	2.4
Oct. 5 S.	. .	0.4
Mean . . .	20 29 24.48	105 44 1.50
Div., Flex., etc.	. .	+ 0.11

LALANDE 39671^2.

1877.	h. m. s.	° ′ ″
Aug. 28 (9.2) E.	20 29 24.51	105 43 58.7
Sept. 21 F.	24.62	58.6
22 F.	24.85	57.0
26 P.	24.59	58.9
Oct. 5 S.	. .	57.4
Mean . . .	20 29 24.64	105 43 58.12
Div., Flex., etc.	. .	+ 0.11

B. A. C. 7149.

1877.	h. m. s.	° ′ ″
Feb. 28 E.	20 33 55.51	74 31 14.5
Div., Flex., etc.	. .	− 0.19

γ^1 DELPHINI.

1877.	h. m. s.	° ′ ″
May 3 (5) P.	20 40 56.29	74 19 5.1
31 (5) P.	56.30	4.3
Dec. 9 P.	56.23	5.0
Mean . . .	20 40 56.27	74 19 4.80
Div., Flex., etc.	. .	− 0.19

γ^2 DELPHINI.

1877.	h. m. s.	° ′ ″
May 3 (4) P.	20 40 57.04	74 19 5.8
31 (4) P.	57.08	5.1
Dec. 9 P.	57.11	5.5
Mean . . .	20 40 57.08	74 19 5.47
Div., Flex., etc.	. .	− 0.19

B. A. C. 7220.

1877.	h. m. s.	° ′ ″
July 26 P.	20 42 47.10	28 38 19.2
30 P.	47.25	19.5
Oct. 13 S.	. .	19.2
Mean . . .	20 42 47.18	28 38 19.30
Div., Flex., etc.	. .	− 0.93

B. A. C. 7220 (Ref.).

1877.	h. m. s.	° ′ ″
July 26 P.	. . . . .	28 38 17.8
30 P.	. . . . .	17.7
Oct. 13 S.	. . . . .	17.8
Mean		28 38 17.77
Div., Flex., etc.	. .	+ 1.54

B. A. C. 7326.

1877.	h. m. s.	° ′ ″
Sept. 26 P.	20 59 15.82	48 51 28.0
Div., Flex., etc.	. .	− 0.40

61^2 CYGNI.

1877.	h. m. s.	° ′ ″
May 3 P.	21 1 24.72	51 51 25.1
July 6 P.	24.78	24.2
12 F.	24.78	24.1
Aug. 10 S.	24.75	. .
Sept. 21 F.	. .	23.5
Oct. 2 P.	. .	22.6
Mean . . .	21 1 24.76	51 51 23.90
Div., Flex., etc.	. .	− 0.10

MURAL ZONES 187, 66.

1877.	h. m. s.	° ′ ″
July 6 (8.8) P.	21 6 58.30	110 35 38.0
Div., Flex., etc.	. .	+ 0.19

O. ARG. S. 21237.

1877.	h. m. s.	° ′ ″
July 6 (8.5) P.	21 7 58.01	110 34 43.5
Div., Flex., etc.	. .	+ 0.19

ι CAPRICORNI.

1877.	h. m. s.	° ′ ″
Dec. 9 P.	21 15 23.80	107 21 26.9
Div., Flex., etc.	. .	+ 0.10

B. A. C. 7504.

1877.	h. m. s.	° ′ ″
Oct. 16 F.	21 23 52.71	3 28 32.9
Nov. 11 (7.8) P.	52.00	31.6
Mean . . .	21 23 52.36	3 28 32.25
Div., Flex.. etc.	. .	− 0.94

B. A. C. 7643.

1877.	h. m. s.	° ′ ″
Sept. 26 (5.5) P.	. . . . .	33 58 16.1
Oct. 14 P.	. .	14.9
Mean		33 58 15.50
Div., Flex.. etc.	. .	− 0.97

B. A. C. 7643 (Ref.).

1877.			h.	m.	s.	°	′	″
Sept.	26	P.	. . . .		. .	33	58	14.1
Oct.	14	P.			. .			13.9
Mean . . .			. . . .		. .	33	58	14.00
Div., Flex., etc.					. .		+	1.40

Weisse (2) 1136.

1877.			h.	m.	s.	°	′	″
Oct.	2 (6.2)	P.	21	47	50.14	70	54	39.8
Nov.	20	E.			50.15			39.7
Mean . . .			21	47	50.14	70	54	39.75
Div., Flex., etc.					. .		−	0.16

O. Arg. N. 23109.

1877.			h.	m.	s.	°	′	″
Nov.	7	F.	21	52	20.32	41	54	56.0
	13 (6.5)	F.			20.25			56.6
	20	E.			20.43		55	0.2
Mean . . .			21	52	20.33	41	54	57.60
Div., Flex., etc.					. .		−	0.80

B. A. C. 7679.

1877.			h.	m.	s.	°	′	″
Oct.	2 (7.5)	P.	21	57	41.39	47	46	43.9
Div., Flex., etc.					. .		−	0.51

B. A. C. 7727.

1877.			h.	m.	s.	°	′	″
Oct.	2 (6.5)	P.	22	3	49.29	42	40	4.1
Nov.	20	E.			49.33			5.3
Dec.	10	E.			49.32			4.8
Mean . . .			22	3	49.31	42	40	4.73
Div., Flex., etc.					. .		−	0.79

Groombridge 3699.

1877.			h.	m.	s.	°	′	″
Oct.	2 (7.2)	P.	22	5	41.02	42	41	26.9
Nov.	20	E.			41.11			27.7
Dec.	10	E.			41.03			27.8
Mean . . .			22	5	41.05	42	41	27.47
Div., Flex., etc.					. .		−	0.79

B. A. C. 7743.

1877.			h.	m.	s.	°	′	″
Oct.	22	F.	22	5	57.02	47	34	28.7
	31	E.			56.90			27.2
Mean . . .			22	5	56.96	47	34	27.95
Div., Flex., etc.					. .		−	0.54

Weisse (2) 175.

1877.			h.	m.	s.	°	′	″
Oct.	18 (8.5)	P.	22	8	25.95	72	35	21.5
	24	P.			25.84			21.1
Mean . . .			22	8	25.90	72	35	21.30
Div., Flex., etc.					. .		−	0.20

B. A. C. 7770.

1877.			h.	m.	s.	°	′	″
Oct.	22	F.	22	9	34.55	47	39	21.0
	31	E.			34.46			21.0
Mean . . .			22	9	34.50	47	39	21.00
Div., Flex., etc.					. .		−	0.53

Durch. 22°, 4614.

1877.			h.	m.	s.	°	′	″
Oct.	18 (9.2)	P.	22	13	16.47	67	6	21.8
Div., Flex., etc.					. .		−	0.07

Lalande 43567.

1877.			h.	m.	s.	°	′	″
Oct.	31	E.	22	13	53.10	105	10	17.5
Nov.	7	F.			53.07			18.8
Mean . . .			22	13	53.08	105	10	18.15
Div., Flex., etc.					. .		+	0.13

Lalande 43596.

1877.			h.	m.	s.	°	′	″
Oct.	31	E.	22	14	56.89	105	4	31.8
Nov.	7	F.			56.84			31.6
Mean . . .			22	14	56.86	105	4	31.70
Div., Flex., etc.					. .		+	0.13

Transit Zones 205, 40.

1877.			h.	m.	s.	°	′	″
Aug.	28	E.	22	16	43.90	105	33	58.8
Div., Flex., etc.					. .		+	0.12

50 Aquarii.

1877.			h.	m.	s.	°	′	″
Sept.	21	F.	22	17	51.77	104	9	6.9
	22	F.			51.75			7.6
	24	F.			51.71			6.9
	26	P.			51.75			7.8
Oct.	1	F.			51.86			7.0
	2	P.			51.75			6.6
	6	F.			51.76			7.0
	12	F.			51.86			6.8
	13	S.			51.76			6.1
	14	P.			51.77			7.4
	15	E.			51.81			8.7
	16	F.			51.77			6.8
	17	S.			. .			7.0
	18 (5.8)	P.			51.72			8.6
Mean . . .			22	17	51.77	104	9	7.23
Div., Flex., etc.					. .		+	0.15

Transit Zones 204, 17.

1877.			h.	m.	s.	°	′	″
Aug.	28	E.	22	19	23.31	105	34	33.6
Div., Flex., etc.					. .		+	0.12

Weisse (2) 467.

1877.			h.	m.	s.	°	′	″
Dec.	10 (6)	E.	22	22	3.15	50	48	59.1
Div., Flex., etc.					. .		−	0.23

Piazzi XXII, 108.

1877.			h.	m.	s.	°	′	″
Aug.	28	E.	22	22	24.31	134	22	44.0
Div., Flex., etc.					. .		+	0.59

B. A. C. 7851.

1877.			h.	m.	s.	°	′	″
Feb.	8	P.	22	22	48.40	. .	. .	.

B. A. C. 7851, S. P.

1877.			h.	m.	s.	°	′	″
Mar.	15	P.	22	22	49.27	355	29	19.0
April	5 (5.2)	P.			49.83			17.9
Mean . . .			22	22	49.55	355	29	18.45
Div., Flex., etc.					. .		−	1.03

σ Aquarii.

1877.			h.	m.	s.	°	′	″
Sept.	21	F.	22	24	8.49	101	18	23.8
	22	F.			8.33			24.0
	24	F.			8.25			22.6
	26	P.			8.30			23.8
Oct.	1	F.			8.37			24.0
	2	P.			8.35			23.4
	6	F.			8.15			23.4
	12	F.			8.35			23.7
	13	S.			8.30			23.7
	14	P.			8.31			23.8
	15	E.			8.29			24.5
	16	F.			8.28			24.1
	17	S.			. .			23.5
	18 (5)	P.			8.27			24.6
Mean . . .			22	24	8.31	101	18	23.78
Div., Flex., etc.					. .		+	0.14

Weisse (2) 698.

1877.			h.	m.	s.	°	′	″
Aug.	28	E.	22	31	36.74	47	2	14.5
Div., Flex., etc.					. .		−	0.61

Weisse (2) 710.

1877.			h.	m.	s.	°	′	″
Oct.	24	P.	22	31	56.12	46	56	27.4
Div., Flex., etc.					. .		−	0.63

Weisse (2) 715.

1877.			h.	m.	s.	°	′	″
Aug.	28	E.	22	32	5.42	47	0	35.2
Div., Flex., etc.					. .		−	0.62

64 Aquarii.

1877.			h.	m.	s.	°	′	″
Sept.	1	F.	22	32	47.66	100	40	1.8
	3	F.			47.74			1.1
	15	F.			. .			2.4
	21	F.			47.74			3.0
	22	F.			47.74			1.3
	24	F.			47.69			0.9
	26	P.			47.67			1.4
Oct.	1	F.			47.82			1.6
	2	P.			47.75			1.8
	6	F.			47.70			1.3
	9	P.			. .			0.5
	12	F.			47.76			1.4
	13	S.			47.66			1.1
	14	P.			47.75			2.0
	15	E.			47.73			1.1
	17	S.			. .			2.1
	18 (6.8)	P.			47.72			2.6
Mean . . .			22	32	47.72	100	40	1.61
Div., Flex., etc.					. .		+	0.12

Weisse 709.

1877.			h.	m.	s.	°	′	″
Aug.	21	E.	22	34	46.97	76	5	49.8
Div., Flex., etc.					. .		−	0.15

B. A. C. 7923.

1877.			h.	m.	s.	°	′	″
Oct.	23	E.	. .	. .	.	60	25	17.3
Div., Flex., etc.					. .		+	0.11

B. A. C. 7923 (Ref.)

1877.			h.	m.	
Oct.	23	E.	. .		
Div., Flex., etc.					

B. A. C. 7931^1.

1877.		h.	m.	s.	°	′	″
Aug. 21 (9)	E.	22	38	31.95	51	10	43.1
28 (10.5)	E.			32.19			44.4
Dec. 10	E.			31.89			42.8
Mean . . .		22	38	32.01	51	10	43.43
Div., Flex., etc.				. .		—	0.19

B. A. C. 7931^2.

1877.		h.	m.	s.	°	′	″
Aug. 21	E.	22	38	32.19	51	10	44.8
28 (8.5)	E.			32.43			44.2
Oct. 24	P.			32.18			43.2
Dec. 10	E.			32.16			43.7
Mean . . .		22	38	32.24	51	10	43.98
Div., Flex., etc.				. .		—	0.19

70 Aquarii.

1877.		h.	m.	s.	°	′	″
Sept. 1	F.	22	42	1.86	101	12	16.8
3	F.			1.89			16.1
15	F.			. .			17.0
21	F.			1.91			16.5
22	F.			1.91			18.5
24	F.			1.81			15.8
26	P.			1.83			16.5
Oct. 1	F.			1.97			16.2
2	P.			1.91			16.1
9	P.			. .			15.3
12	F.			1.92			16.2
14	P.			1.85			16.8
15	E.			1.83			17.2
17	S.			. .			15.9
18 (6.2)	P.			1.86			17.0
Mean . . .		22	42	1.88	101	12	16.53
Div., Flex., etc.				. .		+	0.13

74 Aquarii.

1877.		h.	m.	s.	°	′	″
July 29	S.	22	47	0.08	102	16	13.6
30	P.			0.20			13.7
Aug. 6	S.			. .			13.4
18	F.			0.01			12.3
21	E.			0.16			12.7
27	S.			0.18			13.9
28	E.			0.20			13.1
Sept. 1	F.			0.13			12.6
3	F.			0.10			12.0
15	F.			. .			13.1
Mean . . .		22	47	0.13	102	16	13.04
Div., Flex., etc.				. .		+	0.15

Weisse 966.

1877.		h.	m.	s.	°	′	″
Oct. 23	E.	22	47	37.96	102	50	35.0
31	E.			37.85			34.4
Nov. 13	F.			37.95			34.3
Mean . . .		22	47	37.92	102	50	34.57
Div., Flex., etc.				. .		+	0.16

Weisse 1047.

1877.		h.	m.	s.	°	′	″
Oct. 31 (10)	E.	22	51	39.54	101	47	20.5
Nov. 7	F.			39.76			22.4
13 (9)	F.			39.68			22.4
Mean . . .		22	51	39.66	101	47	21.77
Div., Flex., etc.				. .		+	0.15

B. A. C. 8004.

1877.		h.	m.	s.	°	′	″
Sept. 1	F.	22	53	7.02	103	43	46.5
3	F.			7.06			46.6
15	F.			. .			47.4
Mean . . .		22	53	7.04	103	43	46.83
Div., Flex., etc.				. .		+	0.15

B. A. C. 8013.

1877.		h.	m.	s.	°	′	″
Nov. 20.	E.	22	55	7.19	30	50	41.5
Div., Flex., etc.				. .		—	0.92

Weisse 1156.

1877.		h.	m.	s.	°	′	″
Nov. 7 (8)	F.	22	56	5.68	101	55	35.7
13 (8)	F.			5.67			35.8
17	F.			5.73			36.1
Mean . . .		22	56	5.69	101	55	35.87
Div., Flex., etc.				. .		+	0.15

B. A. C. 8032.

1877.		h.	m.	s.	°	′	″
Jan. 30	S.	22	57	. .	62	35	3.1
Feb. 9	F.			46.90			3.9
Mean . . .		22	57	46.90	62	35	3.50
Div., Flex., etc.				. .		+	0.08

B. A. C. 8032 (Ref.).

1877.		h.	m.	s.	°	′	″
Jan. 30	S.	. .	. .	.	62	35	1.3
Div., Flex., etc.				. .		+	0.29

Weisse 1204.

1877.		h.	m.	s.	°	′	″
Oct. 23	E.	22	58	3.16	102	50	29.1
Nov. 7	F.			3.02			29.0
13 (8)	F.			3.00			27.9
Mean . . .		22	58	3.06	102	50	28.67
Div., Flex., etc.				. .		+	0.16

k^1 Aquarii.

1877.		h.	m.	s.	°	′	″
July 29	S.	22	58	44.98	98	21	27.6
30	P.			45.04			27.4
Aug. 6	S.			. .			27.3
18	F.			44.90			25.8
21	E.			44.94			26.5
27	S.			45.00			26.6
28	E.			45.01			27.3
Mean . . .		22	58	44.98	98	21	26.93
Div., Flex., etc.				. .		+	0.05

Weisse 1232.

1877.		h.	m.	s.	°	′	″
Nov. 16	F.	22	59	28.03	101	6	7.4
20	E.			27.94			4.3
Dec. 9 (8)	P.			27.96			3.5
Mean . . .		22	59	27.98	101	6	5.07
Div., Flex., etc.				. .		+	0.13

Weisse 1241.

1877.		h.	m.	s.	°	′	″
Sept. 21	F.	22	59	51.46	100	16	2.9
22	F.			51.43			6.3
24	F.			51.44			4.9
26	P.			51.42			5.1
Oct. 1	F.			51.40			4.1
2	P.			51.35			4.7
6	F.			51.56			4.4
9	P.			. .			4.1
12	F.			51.47			4.2
14	P.			51.41			5.0
15	E.			51.38			5.2
17	S.			. .			4.3
18 (7.2)	P.			51.35			5.4
Mean . . .		22	59	51.42	100	16	4.66
Div., Flex., etc.				. .		+	0.10

Weisse 1249.

1877.		h.	m.	s.	°	′	″
Nov. 7 (8)	F.	23	0	31.76	103	23	27.5
17	F.			31.72			28.8
Dec. 14	E.			31.66			28.4
Mean . . .		23	0	31.71	103	23	28.23
Div., Flex., etc.				. .		+	0.16

Weisse 1261.

1877.		h.	m.	s.	°	′	″
Dec. 3 (7.8)	P.	23	0	57.96	102	28	16.8
10	E.			58.01			17.2
15	F.			57.91			16.8
Mean . . .		23	0	57.96	102	28	16.93
Div., Flex., etc.				. .		+	0.15

Weisse 49.

1877.		h.	m.	s.	°	′	″
Nov. 17 (9)	F.	23	5	4.10	101	10	34.9
Dec. 8	F.			4.08			32.8
15	F.			3.95			35.1
Mean . . .		23	5	4.04	101	10	34.27
Div., Flex., etc.				. .		+	0.13

Weisse 57^1.

1877.		h.	m.	s.	°	′	″
Dec. 3 (8.2)	P.	23	5	33.52	102	36	3.4
8	F.			33.66			0.8
14	E.			33.32			1.4
Mean . . .		23	5	33.50	102	36	1.87
Div., Flex., etc.				. .		+	0.16

Weisse 57^2.

1877.		h.	m.	s.	°	′	″
Dec. 3 (8.2)	P.	23	5	33.78	102	36	3.6
8	F.			33.87			3.0
14	E.			33.75			1.7
Mean . . .		23	5	33.80	102	36	2.77
Div., Flex., etc.				. .		+	0.16

Weisse 76.

1877.		h.	m.	s.	°	′	″
July 29	S.	23	6	33.97	100	14	20.4
30 (7.5)	P.			34.04			19.9
Aug. 6	S.			. .			20.3
18	F.			33.97			19.6
21	E.			34.10			18.7
27	S.			33.97			20.3
28	E.			34.05			19.9

Weisse 76—Continued.

1877.		h.	m.	s.	°	′	″
Sept. 21	F.	23	6	34.01	100	14	18.8
22	F.			34.02			18.4
24	F.			34.08			18.3
26	P.			34.05			18.9
Oct. 1	F.			34.10			18.6
2	P.			34.04			18.8
6	F.			34.04			19.0
9	P.			. .			18.4
12	F.			34.15			18.6
14	P.			34.04			18.9
15	E.			34.04			19.1
17	S.			. .			18.4
18 (7.0)	P.			33.96			20.2
Mean . . .		23	6	34.04	100	14	19.18
Div., Flex., etc.				. .		+	0.10

Weisse 123.

1877.		h.	m.	s.	°	′	″
Nov. 7 (7)	F.	23	8	15.63	101	21	26.6
13	F.			15.63			25.1
17	F.			15.67			27.7
Mean . . .		23	8	15.64	101	21	26.47
Div., Flex., etc.				. .		+	0.14

Lalande 45504.

1877.		h.	m.	s.	°	′	″
Nov. 7 (8)	F.	23	8	55.88	102	14	6.4
13	F.			55.94			5.3
17	F.			56.11			7.5
Mean . . .		23	8	55.98	102	14	6.40
Div., Flex., etc.				. .		+	0.15

ψ^1 Aquarii.

1877.		h.	m.	s.	°	′	″
Oct. 23	E.	23	9	26.95	99	45	27.0
31	E.			26.85			28.1
Dec. 10	E.			26.89			29.3
Mean . . .		23	9	26.90	99	45	28.13
Div., Flex., etc.				. .		+	0.08

Weisse 185.

1877.		h.	m.	s.	°	′	″
Nov. 20	E.	23	11	14.84	102	23	3.8
Dec. 8	F.			14.89			3.4
14	E.			14.80			5.4
Mean . . .		23	11	14.84	102	23	4.20
Div., Flex., etc.				. .		+	0.15

ψ^2 Aquarii.

1877.		h.	m.	s.	°	′	″
July 29	S.	23	11	30.64	99	51	14.6
30	P.			30.70			15.4
Aug. 6	S.			. .			14.8
18	F.			30.61			13.8
21	E.			30.68			13.7
27	S.			30.71			14.5
28	E.			30.68			14.3
Sept. 21	F.			30.69			13.2
22	F.			30.74			14.4
24	F.			30.60			13.7
26	P.			. .			13.8
Oct. 1	F.			30.75			13.8
2	P.			30.65			13.4
6	F.			30.74			13.7
12	F.			30.80			13.0
14	P.			30.63			13.0
15	E.			30.72			14.1
17	S.			. .			12.8
18 (4.8)	P.			30.65			13.9
Mean . . .		23	11	30.69	99	51	13.89
Div., Flex., etc.				. .		+	0.08

Durch. 62°, 2208.

1877.		h.	m.	s.	°	′	″
Oct. 24	P.	23	11	59.31	27	32	4.9
Div., Flex., etc.				. .		—	0.93

Anonymous.

1877.		h.	m.	s.	°	′	″
Oct. 24	P.	23	12	32.69	27	28	47.3
Div., Flex., etc.				. .		—	0.94

ψ^3 Aquarii.

1877.		h.	m.	s.	°	′	″
Nov. 7 (5.5)	F.	23	12	33.89	100	16	59.7
Dec. 3 (5.2)	P.			33.78		17	0.3
10	E.			33.84		16	59.6
Mean . . .		23	12	33.84	100	16	59.87
Div., Flex., etc.				. .		+	0.10

Weisse 228.

1877.		h.	m.	s.	°	′	″
Nov. 20	E.	23	12	37.14	102	50	34.3
Dec. 8	F.			37.20			34.0
9 (8.2)	P.			37.06			32.6
Mean . . .		23	12	37.13	102	50	33.63
Div., Flex., etc.				. .		+	0.16

Weisse 265.

1877.		h.	m.	s.	°	′	″
Oct. 23	E.	23	14	28.72	101	12	20.4
Nov. 13	F.			28.66			21.3
17 (8)	F.			28.77			22.2
Mean . . .		23	14	28.72	101	12	21.30
Div., Flex., etc.				. .		+	0.13

97 Aquarii.

1877.		h.	m.	s.	°	′	″
Sept. 21	F.	23	16	12.35	105	42	50.1
22	F.			12.33			50.8
24	F.			12.28			51.5
26	P.			12.35			51.0
Oct. 1	F.			12.45			50.0
2	P.			12.29			50.6
6	F.			12.42			51.8
12	F.			12.42			51.7
14	P.			12.31			50.0
15	E.			12.35			50.5
17	S.			. .			50.3
18 (5.2)	P.			12.32			51.2
Mean . . .		23	16	12.35	105	42	50.79
Div., Flex., etc.				. .		+	0.12

Weisse 309.

1877.		h.	m.	s.	°	′	″
Nov. 7 (8)	F.	23	16	37.63	101	26	51.8
17	F.			37.73			53.3
20	E.			37.66			53.0
Mean . . .		23	16	37.67	101	26	52.70
Div., Flex., etc.				. .		+	0.14

Weisse 315.

1877.		h.	m.	s.	°	′	″
Dec. 3 (8.2)	P.	23	16	54.44	100	3	35.3
6	E.			. .			35.0
8	F.			54.54			34.7
9 (8.8)	P.			54.39			32.9
Mean . . .		23	16	54.46	100	3	34.48
Div., Flex., etc.				. .		+	0.09

Anonymous.

1877.		h.	m.	s.	°	′	″
July 30 (10.8)	P.	23	20	10.68	97	34	35.5
Div., Flex., etc.				. .		+	0.08

Weisse 377.

1877.		h.	m.	s.	°	′	″
Oct. 23	E.	23	20	13.49	100	42	38.8
Dec. 6	E.			. .			37.7
8	F.			13.48			38.5
Mean . . .		23	20	13.48	100	42	38.33
Div., Flex., etc.				. .		+	0.12

Weisse 394.

1877.		h.	m.	s.	°	′	″
Sept. 1	F.	23	21	2.20	103	36	21.6
3	F.			2.28			20.9
Mean . . .		23	21	2.24	103	36	21.25
Div., Flex., etc.				. .		+	0.15

Weisse 402.

1877.		h.	m.	s.	°	′	″
Nov. 7 (7)	F.	23	21	41.24	102	7	35.4
20	E.			41.18			33.4
Dec. 10	E.			41.17			34.4
Mean . . .		23	21	41.20	102	7	34.40
Div., Flex., etc.				. .		+	0.15

Weisse 427.

1877.		h.	m.	s.	°	′	″
Nov. 20	E.	23	22	38.98	99	56	33.7
Dec. 3 (6.8)	P.			38.90			35.2
8	F.			39.04			33.5
10	E.			38.91			34.7
Mean . . .		23	22	38.96	99	56	34.37
Div., Flex., etc.				. .		+	0.09

B. A. C. 8199.

1877.		h.	m.	s.	°	′	″
Sept. 1	F.	23	25	50.05	102	13	22.7
3	F.			50.01			22.4
Mean . . .		23	25	50.03	102	13	22.55
Div., Flex., etc.				. .		+	0.15

Weisse 497.

1877.		h.	m.	s.	°	′	″
Oct. 23	E.	23	26	3.56	101	40	39.7
Nov. 2	S.			3.48			40.9
7 (7.5)	F.			3.50			39.5
Mean . . .		23	26	3.51	101	40	40.03
Div., Flex., etc.				. .		+	0.14

B. A. C. 8213.

1877.		h.	m.	s.	°	′	″
Dec. 3 (5.8)	P.	23	27	50.19	3	22	17.3
Div., Flex., etc.				. .		—	0.94

B. A. C. 8213, S. P.

1877.		h.	m.	s.	°	′	″
Feb. 20	P.	23	27	50.79	356	37	44.3
Div., Flex., etc.				. .		—	1.02

Weisse 571.

1877.	h. m. s.	° ′ ″
Nov. 7 (7.5) F.	23 29 5.81	101 14 5.4
13 F.	5.82	6.0
17 F.	5.86	7.9
Mean . . .	23 29 5.83	101 14 6.43
Div., Flex., etc.	. .	+ 0.13

Weisse 586.

1877.	h. m. s.	° ′ ″
Nov. 2 S.	23 29 39.36	99 26 41.8
13 F.	39.48	41.8
17 F.	39.49	44.4
Mean . . .	23 29 39.44	99 26 42.67
Div., Flex., etc.	. .	+ c.07

B. A. C. 8221.

1877.	h. m. s.	° ′ ″
Sept. 1 F.	23 31 16.93	103 44 30.0
3 F.	16.95	30.1
Mean . . .	23 31 16.94	103 44 30.05
Div., Flex., etc.	. .	+ 0.15

Weisse 629.

1877.	h. m. s.	° ′ ″
Oct. 23 E.	23 31 51.38	99 18 29.6
Nov. 7 F.	51.44	30.1
13 F.	51.47	30 6
Mean . . .	23 31 51.43	99 18 30.10
Div., Flex., etc.	. .	+ 0.06

B. A. C. 8229.

1877.	h. m. s.	° ′ ″
Oct. 2 (4) P.	23 32 6.44	47 24 45.4
Dec. 10 E.	6.47	46.1
Mean . . .	23 32 6.46	47 24 45.75
Div., Flex., etc.	. .	— 0.56

B. A. C. 8239.

1877.	h. m. s.	° ′ ″
July 29 S.	23 34 46.97	102 21 46.5
30 P.	47.02	47.0
Aug. 6 S.	. .	46.7
18 F.	46.95	44.8
21 E.	46.98	45.2
27 S.	47.04	47.0
28 E.	46.95	46.5
Mean . . .	23 34 46.98	102 21 46.24
Div., Flex., etc.	. .	+ 0.15

B. A. C. 8245.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	23 36 11.60	45 41 24.0
Dec. 14 E.	11.60	23.5
15 F.	11.58	25.1
Mean . . .	23 36 11.59	45 41 24.20
Div., Flex., etc.	. .	— 0.76

B. A. C. 8266.

1877.	h. m. s.	° ′ ″
July 29 S.	23 40 55.81	102 35 30.0
30 (6.2) P.	55.85	29.2
Aug. 6 S.	. .	30.1

B. A. C. 8266—Continued.

1877.	h. m. s.	° ′ ″
Aug. 18 F.	23 40 55.82	102 35 27.7
21 E.	55.81	29.1
27 S.	56.00	29.8
28 E.	55.90	29.8
Sept. 1 F.	55.85	29.0
3 F.	55.96	28.3
Mean . . .	23 40 55.88	102 35 29.22
Div., Flex., etc.	. .	+ 0.16

B. A. C. 8268.

1877.	h. m. s.	° ′ ″
April 10 F.	23 41 3.06	32 2 0.6
Oct. 2 P.	3.08	1 59.6
Nov. 20 E.	. .	2 1.8
Dec. 10 E.	2.93	0.5
11 F.	3.03	0.1
Mean . . .	23 41 3.02	32 2 0.52
Div., Flex., etc.	. .	— 0.94

B. A. C. 8268 (Ref.).

1877.	h. m. s.	° ′ ″
Oct. 2 P.	. . . . .	32 1 57.7
Nov. 20 E.	. .	58.8
Dec. 10 E.	. .	57.3
Mean . . .	. . . . .	32 1 57.93
Div., Flex., etc.	. .	+ 1.44

Anonymous.

1877.	h. m. s.	° ′ ″
Nov. 16 (9.0) E.	23 41 30.54	95 36 47.2
19 (8.8) P.	30.51	47.7
Dec. 6 E.	30.46	50.2
Mean . . .	23 41 30.50	95 36 48.37
Div., Flex., etc.	. .	+ 0.20

Anonymous.

1877.	h. m. s.	° ′ ″
Oct. 14 P.	23 43 18.02	103 1 45.0
Nov. 19 (10.2) P.	17.96	43.7
Dec. 14 E.	18.09	43.1
Mean . . .	23 43 18.02	103 1 43.93
Div., Flex., etc.	. .	+ 0.16

B. A. C. 8285.

1877.	h. m. s.	° ′ ″
July 29 S.	23 43 53.88	100 39 40.0
30 (6.5) P.	53.93	38.8
Aug. 6 S.	. .	39.5
18 F.	. .	38.1
21 E.	53.86	38.0
27 S.	53.99	39.4
28 E.	53.95	39.0
Mean . . .	23 43 53.92	100 39 38.97
Div., Flex., etc.	. .	+ 0.12

O. Arg. N. 26144.

1877.	h. m. s.	° ′ ″
Oct. 14 P.	23 47 40.07	19 11 37.7
24 P.	40.30	38.1
Nov. 16 (9.0) E.	40.07	37.7
Mean . . .	23 47 40.15	19 11 37.83
Div., Flex., etc.	. .	— 1.17

Weisse 985.

1877.	h. m. s.	° ′ ″
July 29 S.	23 49 26.63	103 50 6.3
30 P.	. .	6.4
Aug. 6 S.	. .	6.3
18 F.	. .	5.4
21 E.	26.65	5.5
27 S.	26.75	6.4
28 E.	26.73	6.1
Mean . . .	23 49 26.69	103 50 6.06
Div., Flex., etc.	. .	+ 0.15

Weisse (2) 1027.

1877.	h. m. s.	° ′ ″
Sept. 26 (6.2) P.	23 50 25.61	68 2 11.1
Nov. 3 F.	25.62	10.3
Dec. 6 E.	25.53	11.8
Mean . . .	23 50 25.59	68 2 11.07
Div., Flex., etc.	. .	— 0.11

Durch. 70°, 1340.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	23 54 29.54	19 9 7.7
Nov. 16 (9.8) E.	29.27	7.4
Dec. 10 E.	29.13	7.6
14 E.	29.70	7.3
Mean . . .	23 54 29.41	19 9 7.67
Div., Flex., etc.	. .	— 1.17

Weisse 1114.

1877.	h. m. s.	° ′ ″
Dec. 11 F.	23 55 31.30	93 42 43.7
15 F.	31.23	44.2
Mean . . .	23 55 31.26	93 42 43.95
Div., Flex., etc.	. .	+ 0.27

Σ 3052^1.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	23 56 38.49	19 19 35.0
Dec. 10 E.	38.32	33.3
14 E.	38.31	34.2
Mean . . .	23 56 38.37	19 19 34.17
Div., Flex., etc.	. .	— 1.17

Σ 3052^2.

1877.	h. m. s.	° ′ ″
Oct. 24 P.	23 56 39.47	19 19 1.1
Dec. 10 E.	39.42	0.5
14 E.	39.27	1.7
Mean . . .	23 56 39.39	19 19 1.10
Div., Flex., etc.	. .	— 1.17

B. A. C. 8359.

1877.	h. m. s.	° ′ ″
Nov. 16 E.	23 57 54.21	28 23 51.8
17 F.	54.21	51.8
Dec. 6 E.	54.34	50.8
Mean . . .	23 57 54.25	28 23 51.47
Div., Flex., etc.	. .	— 0.93

MEAN RIGHT ASCENSIONS FOR 1877.0

OF

STARS OBSERVED

WITH THE

TRANSIT INSTRUMENT.

1877.

MEAN RIGHT ASCENSIONS FOR 1877.0

OF

STARS OBSERVED WITH THE TRANSIT INSTRUMENT.

1877.	h. m. s.	Mag.
B. A. C. 8374, + 28° 21′.		
Sept. 2 . .	0 0 14.03	
Oct. 24 . .	13.91	6.0
(*)+ 28° 21′.		
Oct. 9 . .	0 0 29.57	
Weisse 1218, + 1° 11′.		
Nov. 16 . .	0 0 33.89	8.2
17 . .	33.83	8.5
Lalande 47298, + 36° 30′.		
Sept. 4 . .	0 1 22.43	7.2
20 . .	22.37	
30 . .	22.60	
B. A. C. 10, − 28° 39′.		
Dec. 15 . .	0 3 4.54	
Weisse 21, + 12° 3′.		
Dec. 14 . .	0 3 33.49	8.0
Lalande 89, +37° 0′.		
Oct. 9 . .	0 6 27.10	6.5
Weisse 90, + 2° 42′.		
Aug. 28 . .	0 6 46.81	9.0
Sept. 30 . .	46.81	8.2
γ Pegasi, + 14° 30′.		
Jan. 5 . .	0 6 54.25	
Sept. 2 . .	54.16	
20 . .	54.28	
Oct. 11 . .	54.20	
22 . .	54.20	
23 . .	54.25	
24 . .	54.17	
Nov. 16 . .	54.21	
17 . .	54.22	
19 . .	54.16	
Dec. 14 . .	54.14	
15 . .	54.18	
Weisse 112, + 2° 42′.		
Aug. 28 . .	0 8 23.33	8.0
Sept. 4 . .	23.31	
30 . .	23.35	8.0
Lalande 231, + 39° 8′.		
Nov. 17 . .	0 10 27.49	8.2
(*)+ 0° 5′.		
Oct. 9 . .	0 10 31.55	9.5
θ Andromedæ, + 38° 2′.		
Nov. 19 . .	0 10 39.97	
σ Andromedæ, + 36° 6′.		
Jan. 5 . .	0 11 54.20	
Dec. 15 . .	54.25	
Radcliffe 65, + 44° 12′.		
Oct. 9 . .	0 13 58.53	8.8
Nov. 19 . .	58.32	
(*)+44° 14′.		
Sept. 30 . .	0 14 19.12	
Lacaille 48, − 24° 18′.		
Oct. 23 . .	0 14 36.24	7.0
Radcliffe 73, + 44° 12′.		
Sept. 2 . .	0 14 40.17	7.5
20 . .	40.09	8.0
Oct. 9 . .	40.23	
Nov. 19 . .	40.04	
Lalande 380, + 37° 43′.		
Oct. 11 . .	0 14 41.56	8.0
(*)+44° 12′.		
Aug. 28 . .	0 15 11.12	8.8
Nov. 16 . .	10.96	
17 . .	10.77	9.0
(*)+44° 12′.		
Sept. 30 . .	0 15 56.99	
Radcliffe 79, + 44° 12′		
Nov. 16 . .	0 16 1.00	
Dec. 14 . .	0.69	8.5
9 Ceti, − 12° 52′.		
Dec. 15 . .	0 16 33.41	
B. A. C. 83, + 52° 22′.		
Jan. 5 . .	0 18 27.84	
Oct. 23 . .	27.73	
Lalande 489, + 38° 22′.		
Nov. 17 . .	0 18 35.73	8.2
B. A. C. 92, + 55° 57′.		
Oct. 11 . .	0 19 56.32	7.2
48 Piscium, + 15° 46′		
Jan. 5 . .	0 21 49.50	6.0
Dec. 15 . .	49.38	
(*)+15° 22′.		
Nov. 17 . .	0 22 19.24	8.5
(*)+ 15° 21′.		
Aug. 28 . .	0 22 42.28	8.2
Nov. 17 . .	42.04	8.0
Dec. 14 . .	42.22	8.5
Weisse 358, + 7° 25′.		
Oct. 9 . .	0 23 2.85	9.0
(*)+42° 37′.		
Sept. 30 . .	0 23 39.83	8.4
(*)+42° 39′.		
Oct. 22 . .	0 23 40.53	
(*)+42° 37′.		
Sept. 30 . .	0 23 42.53	8.2
Oct. 22 . .	42.59	
49 Piscium, + 15° 23′.		
Aug. 28 . .	0 24 23.93	7.8
Nov. 16 . .	23.83	6.5
17 . .	23.73	6.5
Dec. 14 . .	23.85	6.5
(*)+36° 16′.		
Sept. 4 . .	0 24 47.01	
Oct. 23 . .	47.00	8.2
(*)+ 38° 15′.		
Oct. 23 . .	0 24 50.95	8.2
(*)+36° 15′.		
Sept. 4 . .	0 24 55.81	
B. A. C. 122, +15° 22′.		
Aug. 28 . .	0 25 12.55	7.5
52 Piscium, +19° 37′.		
Jan. 5 . .	0 26 8.71	6.0
Dec. 15 . .	8.65	
(*)+36° 8′.		
Aug. 28 . .	0 28 34.27	9.0
Lalande 849, + 36° 6′.		
Aug. 28 . .	0 28 34.88	7.5
Sept. 2 . .	34.89	
Weisse 446, + 3° 42′		
Sept. 30 . .	0 28 37.14	8.3
Oct. 9 . .	37.13	8.3
23 . .	37.20	8.3
(*)+7° 25′.		
Sept. 20 . .	0 29 24.28	8.5
Lalande 884, + 37° 36′.		
Dec. 15 . .	0 29 30.13	
(*)+33° 1′.		
Sept. 4 . .	0 29 48.55	8.5
Nov. 16 . .	48.64	
ζ Cassiopeæ, +53° 13′.		
Jan. 5 . .	0 30 7.64	
9 . .	7.89	
π Andromedæ, + 33° 6′.		
Sept. 4 . .	0 30 18.73	
Oct. 11 . .	18.73	
Dec. 14 . .	18.69	4.5
Weisse (2) 749, + 33° 6′.		
Sept. 4 . .	0 30 19.07	8.3
Oct. 11 . .	19.18	
Nov. 16 . .	19.09	8.0
Dec. 14 . .	19.18	8.8
Weisse (2) 832, + 26° 4′.		
Oct. 23 . .	0 32 57.81	8.2
Lalande 1003, + 36° 8′.		
Oct. 22 . .	0 32 58.46	8.0
Dec. 15 . .	58.41	
55 Piscium, + 20° 46′.		
Jan. 5 . .	0 33 27.26	
Nov. 19 . .	27.14	

1877.		h.	m.	s.	Mag.
Weisse 583, + 2° 54′.					
Aug.	28	0	35	1.63	7.5
Sept.	4			1.71	
Weisse 588, + 2° 55′.					
Aug.	28	0	35	26.61	8.0
Sept.	4			26.(37)	
(*)+4° 6′.					
Sept.	2	0	35	59.28	9.0
(*)+4° 3′.					
Sept.	2	0	35	59.87	8.5
	20			59.63	8.3
Oct.	9			59.83	9.0
(*)+ 4° 3′.					
Sept.	2	0	36	2.57	9.5
λ^1 Sculptoris, —39° 7′.					
Dec.	15	0	36	47.29	
β Ceti, — 18° 40′.					
Jan.	9	0	37	24.89	
Sept.	4			24.91	
	20			24.71	
Nov.	19			24.87	
B. A. C. 197, + 47° 11′.					
Nov.	16	0	37	36.63	5.5
(*)—1° 29′.					
Sept.	2	0	38	38.02	9.0
(*)+ 47° 11′.					
Oct.	23	0	39	2.39	8.5
(*)+ 47° 12′.					
Oct.	23	0	39	5.57	7.5
Weisse 664, — 1° 29′.					
Sept.	30	0	39	37.88	
Oct.	9			38.08	
58 Piscium, + 11° 19′.					
Dec.	15	0	40	36.53	
61 Piscium, + 20° 15′.					
Nov.	16	0	41	23.42	
ν Cassiopeæ, +50° 18′.					
Jan.	9	0	41	52.51	
(*)+ 40° 24′.					
Oct.	11	0	42	30.12	8.0
	23			30.37	8.0

1877.		h.	m.	s.	Mag.
B. A. C. 224, + 28° 3′.					
Jan.	5	0	42	33.95	7.0
ν Andromedæ, + 40° 24′.					
Oct.	11	0	43	2.08	6.0
	23			2.28	5.5
(*)+3° 6′.					
Sept.	30	0	43	6.73	
Oct.	9			7.04	
O. Arg. S. 443, — 24° 3′.					
Aug.	28	0	43	18.22	
O. Arg. S. 447, — 24° 3′.					
Aug.	28	0	43	30.18	
Sept.	2			29.86	7.0
(*)+3° 3′.					
Sept.	30	0	43	35.31	
Weisse 732, —0° 52′.					
Dec.	15	0	43	36.77	
(*)+36° 15′.					
Nov.	16	0	46	10.02	8.2
Weisse 801, + 8° 7′.					
Oct.	11	0	47	6.02	8.7
Lalande 1492, + 38° 24′.					
Aug.	28	0	47	29.63	
Sept.	2			29.42	6.5
	20			29.63	
Lalande 1504 (1st *), + 38° 28′.					
Aug.	28	0	47	50.41	
Sept.	2			50.15	
	4			50.26	
	30			50.27	
Lalande 1504 (2d *), + 38° 28′.					
Aug.	28	0	47	50.37	
Sept.	30			50.33	8.5
21 Ceti, — 9° 24′.					
Jan.	5	0	48	5.15	
(*)+ 36° 30′.					
Sept.	30	0	51	26.78	8.5
(*)+1° 50′.					
Oct.	9	0	51	39.43	8.0
	11			39.38	7.8
(*)+ 36° 32′.					
Sept.	30	0	51	56.97	8.0
Oct.	22			57.01	8.0
	23			57.07	8.0

1877.		h.	m.	s.	Mag.
(*)+ 1° 57′.					
Oct.	11	0	52	4.21	9.0
φ Ceti, — 12° 5′.					
Aug.	28	0	52	34.43	6.0
Sept.	2			34.30	5.5
	20			34.31	6.0
B. A. C. 274, +5° 48′.					
Jan.	9	0	53	27.18	6.5
Lacaille 276, — 34° 0′.					
Nov.	16	0	55	31.55	
(*)+1° 30′.					
Aug.	28	0	55	52.43	8.5
(*)+3° 47′.					
Oct.	22	0	56	18.59	8.0
Weisse 969, +1° 32′.					
Aug.	28	0	56	24.83	9.0
Sept.	20			25.22	8.5
25 Ceti, — 5° 29′.					
Jan.	5	0	56	49.20	
(*)—24° 46′.					
Sept.	30	0	56	57.41	
Oct.	11			57.43	9.2
μ Cassiopeæ, +54° 19′.					
Sept.	20	1	0	6.16	
Weisse 1043, +7° 42′.					
Oct.	9	1	0	13.82	6.8
O. Arg. N. 1118, +54° 28′.					
Aug.	28	1	0	49.28	
Sept.	4			49.14	
29 Ceti, +1° 23′.					
Oct.	22	1	1	39.17	6.0
Nov.	16			39.14	
Weisse 1085, +9° 6′.					
Oct.	11	1	2	30.05	
θ Cassiopeæ, +54° 30′.					
Oct.	23	1	3	37.54	5.0
(*)+11° 43′.					
Oct.	22	1	5	7.13	
Weisse 42, +11° 41′.					
Sept.	20	1	5	7.30	8.4
Oct.	9			7.36	
	22			7.26	

1877.		h.	m.	s.	M
Weisse 65, +11° 7′.					
Oct.	11	1	6	38.13	8
Weisse 66, +11° 3′.					
Oct.	11	1	6	40.50	7
Weisse 91, —2° 50′.					
Nov.	16	1	7	48.66	
Weisse 89, +0° 49′.					
Jan.	9	1	7	51.52	9
B. A. C. 385, — 34° 48′.					
Aug.	28	1	10	24.20	7
Oct.	11			24.06	7
Weisse 137, +13° 16′.					
Sept.	20	1	10	51.53	8
	30			51.63	8
Weisse 144, +12° 54′.					
Jan.	9	1	11	12.16	
Oct.	9			12.34	
	22			12.36	
Weisse 165, +13° 13′.					
Sept.	4	1	12	42.45	
	30			42.49	
Weisse 188 (1st *), +13° 10′.					
Sept.	20	1	13	43.70	
Weisse 188 (2d *), +13° 10′.					
Sept.	20	1	13	44.15	
	30			44.48	
(*)+5° 58′.					
Jan.	9	1	14	17.64	
B. A. C. 411, —37° 42′.					
Aug.	28	1	16	33.82	
Sept.	2			33.69	
(*)+38° 24′.					
Sept.	4	1	17	21.83	
	20			21.84	
(*)+ 38° 24′.					
Sept.	4	1	17	26.99	
	20			27.09	
44 Ceti, —8° 40′.					
Jan.	5	1	17	51.30	
Sept.	30			51.40	
Oct.	11			51.37	
θ Ceti, —8° 49′.					
Oct.	9	1	17	52.53	
Dec.	15			52.55	

1877.		h. m. s.	Mag.
B. A. C. 424, −32° 28′.			
Jan.	9	1 18 28.36	
(*)−37° 31′.			
Oct.	22	1 23 16.98	6.5
	23	17.18	
Weisse 382, +10° 28′.			
Oct.	11	1 23 49.11	
η Piscium, +14° 43′.			
Nov.	16	1 24 54.10	
Dec.	14	54.17	
(*)+15° 4′.			
Oct.	23	1 26 28.02	8.5
Weisse (2) 575, +15° 7′.			
Oct.	22	1 27 25.13	8.4
	23	24.94	8.3
B. A. C. 469, +17° 51′			
Oct.	11	1 28 9.87	
103 Piscium, +16° 0′.			
Jan.	9	1 32 37.77	
Lacaille 477, −32° 47′.			
Oct.	23	1 33 2.87	6.5
Weisse 562, +2° 51′.			
Oct.	11	1 33 22.20	8.0
(*)+37° 39′.			
Oct.	22	1 33 49.47	7.3
107 Piscium, +19° 40′.			
Jan.	9	1 35 49.40	
Weisse 643, −9° 20′.			
Sept.	2	1 36 24.58	
	4	24.54	7.0
109 Piscium, +19° 28′.			
Jan.	5	1 38 12.81	
ο Piscium, +8° 32′.			
Jan.	9	1 38 (53.88)	
	26	54.15	
Sept.	2	53.95	
	20	54.02	
	30	54.11	
Oct.	11	54.08	
	22	54.06	
	23	54.10	
(*)+13° 36′.			
Aug.	28	1 43 24.86	8.5
Sept.	2	24.82	7.8
B. A. C. 563, −39° 0′.			
Sept.	30	1 44 30.02	
Lalande 3390, +36° 50′.			
Sept.	4	1 45 7.54	7.0
Oct.	11	7.80	6.5
	23	7.49	6.5
(*)+36° 47′.			
Sept.	20	1 45 12.21	8.5
Oct.	11	12.29	8.5
	23	12.04	8.8
β Arietis, +20° 12′.			
Jan.	5	1 47 50.85	
	9	50.84	
	26	50.74	
	29	50.76	
Sept.	4	50.74	
	20	50.88	
B. A. C. 578, −39° 12′.			
Aug.	28	1 48 5.31	
Sept.	2	5.40	5.0
	30	5.25	
56 Ceti, −23° 7′.			
Oct.	23	1 50 54.57	5.5
B. A. C. 609, +11° 44′.			
Oct.	11	1 52 50.86	5.5
B. A. C. 613, −41° 45′.			
Sept.	30	1 53 19.63	6.5
O. Arg. S. 1219, −24° 2′.			
Sept.	2	1 54 41.97	7.2
α Piscium, +2° 11′.			
Jan.	5	1 55 40.98	
	9	41.01	
Weisse 973, +12° 54′.			
Oct.	23	1 55 58.08	6.5
O. Arg. S. 1259, −24° 28′.			
Sept.	30	1 57 10.88	6.0
54 Cassiopeæ, +71° 0′.			
Oct.	11	1 58 33.35	
(*)+13° 57′.			
Aug.	28	1 59 2.36	9.0
Sept.	2	2.28	
Weisse 1040, +7° 39′.			
Jan.	9	1 59 42.55	
α Arietis, +22° 52′.			
Jan.	5	2 0 14.52	
(*)+39° 0′.			
Sept.	30	2 1 34.27	8.2
Oct.	23	34.21	8.5
(*)+38° 59′.			
Oct.	11	2 2 30.73	8.5
	23	30.63	8.3
64 Ceti, +7° 59′.			
Sept.	4	2 4 51.50	
ξ¹ Ceti, +8° 16′.			
Jan.	9	2 6 28.97	
Aug.	28	28.91	
Sept.	4	28.90	
Weisse 102, +4° 18′.			
Oct.	23	2 8 33.79	8.2
(*)+55° 18′.			
Oct.	11	2 8 40.60	8.0
(*)+55° 18′.			
Sept.	30	2 9 13.08	8.0
Oct.	11	13.10	8.0
(*)+55° 18′.			
Sept.	30	2 9 21.90	8.3
(*)+55° 18′.			
Oct.	11	2 9 47.84	8.0
Lalande 4238, +17° 53′.			
Sept.	4	2 10 57.25	7.5
(*)+55° 17′.			
Sept.	2	2 11 1.45	8.5
(*)+55° 21′.			
Oct.	11	2 12 10.46	6.3
(*)+55° 18′.			
Sept.	30	2 12 19.07	8.0
Oct.	11	19.11	8.0
B. A. C. 718, +56° 40′.			
Oct.	23	2 13 14.97	7.5
(*)+56° 40′.			
Oct.	23	2 13 35.82	8.2
ι Persei, +55° 16′.			
Sept.	30	2 13 47.55	6.0
(*)+56° 41′.			
Oct.	23	2 14 11.95	
(*)+56° 41′.			
Oct.	23	2 14 29.69	
(*)+56° 41′.			
Oct.	23	2 14 42.35	
69 Ceti −0° 9′.			
Sept.	2	2 15 38.58	5.5
ξ Arietis, +10° 3′.			
Aug.	28	2 18 13.55	5.5
Sept.	2	13.57	5.0
Weisse 278, +8° 1′.			
Oct.	11	2 18 38.55	8.4
(*)+9° 58′.			
Oct.	23	2 19 6.20	7.3
B. A. C. 750, +10° 3′.			
Aug.	28	2 19 34.73	6.5
Sept.	2	34.80	7.0
Weisse 305, +9° 57′.			
Sept.	30	2 20 9.83	6.0
Oct.	23	9.93	6.5
(*)+9° 59′.			
Sept.	30	2 20 12.40	7.5
Oct.	23	12.46	7.7
(*)+61° 11′.			
Sept.	30	2 23 4.13	8.0
Oct.	11	4.15	8.0
(*)+61° 9′.			
Oct.	11	2 23 22.17	6.5
Lacaille 767, −33° 39′.			
Oct.	23	2 25 1.71	7.5
75 Ceti, −1° 36′.			
Aug.	28	2 25 53.89	5.5
Lalande 4761, +36° 31′.			
Sept.	30	2 28 21.66	7.0
31 Arietis, +11° 54′.			
Sept.	16	2 29 55.51	
Oct.	11	55.56	
B. A. C. 803, −30° 35′.			
Aug.	28	2 30 51.00	6.0

Star	1877.	h. m. s.	Mag.
Weisse (2) 718, +30° 18'.	Sept. 30	2 31 13.65	
Weisse (2) 727, +25° 44'.	Oct. 23	2 31 27.89	9.0
B. A. C. 810, +10° 8'.	Oct. 11	2 32 26.11	
(*)−34° 12'.	Sept. 2	2 32 44.64	7.0
O. Arg. S. 1744, −18° 20'.	Oct. 23	2 35 28.24	7.7
γ Ceti, +2° 43'.	Jan. 24	2 36 55.69	
	Sept. 2	55.75	
	30	55.67	
	Oct. 11	55.64	
B. A. C. 857, +56° 32'.	Oct. 23	2 40 11.27	
B. A. C. 858, +56° 35'.	Oct. 23	2 40 26.87	
Weisse (2) 972, +24° 50'.	Sept. 2	2 41 24.89	7.7
Lalande 5181, +36° 18'.	Aug. 28	2 41 55.58	
Weisse 702, +12° 32'.	Sept. 30	2 42 3.10	8.2
Weisse (2) 1018, +24° 52'.	Sept. 2	2 43 4.20	7.0
	Oct. 11	4.26	7.0
17 Persei, +34° 32'.	Sept. 16	2 43 56.14	
β Fornacis, −32° 56'.	Jan. 24	2 43 56.56	
τ Persei, +52° 15'.	Aug. 28	2 45 32.73	5.0
Weisse 790, +8° 51'.	Sept. 30	2 47 9.99	7.0
	Oct. 11	9.97	7.2
Rumker 742, +22° 27'.	Sept. 2	2 48 25.54	8.8
ρ^2 Arietis, +17° 50'.	Jan. 24	2 48 54.03	
Weisse 846, +0° 3'.	Oct. 11	2 49 37.83	
Weisse 853, +0° 3'.	Oct. 11	2 49 55.11	
(*)+14° 39'.	Sept. 2	2 51 50.74	8.5
	16	50.51	8.0
(*)+14° 41'.	Jan. 26	2 52 21.32	9.5
(*)+14° 40'.	Aug. 28	2 52 27.5[illegible]	
	Sept. 2	27.37	9.0
(*)+38° 26'.	Sept 30	2 54 3.29	6.5
	Oct. 11	3.24	6.0
	23	3.34	6.0
η Ceti, +3° 36'.	Jan. 24	2 55 51.07	
	Feb. 8	51.17	
	Aug. 28	51.03	
(*)+37° 6'.	Sept. 2	2 58 14.18	8.0
	30	14.21	7.7
	Oct. 11	14.28	7.0
	23	14.27	7.5
(*)+50° 42'.	Aug. 28	2 59 43.06	6.5
	Sept. 16	42.99	6.5
B. A. C. 975, +8° 1'.	Feb. 8	3 2 3.66	
(*)+9° 30'.	Jan. 24	3 4 21.36	9.0
(*)+38° 27'.	Aug. 28	3 5 6.05	
(*)+38° 27'.	Sept. 2	3 5 7.86	8.5
(*)+38° 27'.	Aug. 28	3 5 12.14	
	Sept. 2	12.21	8.5
(*)+38° 27'.	Aug. 28	3 5 29.35	
	Sept. 2	29.46	8.5
(*)+38° 28'.	Sept. 30	3 5 52.52	
	Oct. 23	52.17	8.5
(*)+37° '13.	Oct. 11	3 6 10.55	7.7
ζ Arietis, +20° 35'.	Feb. 8	3 7 49.86	
	Aug. 28	50.00	
	Sept. 30	50.02	
	Oct. 23	50.07	
B. A. C. 1010, −9° 12'.	Jan. 24	3 9 32.91	
Weisse (2) 209, +23° 38'.	Sept. 30	3 11 7.60	7.2
	Oct. 11	7.58	7.0
Weisse 173, +14° 45'.	Oct. 23	3 11 36.15	7.0
15 Eridani, −22° 57'.	Jan. 24	3 12 55.81	
	Feb. 8	55.74	
Weisse 251, +8° 48'.	Sept. 30	3 15 11.79	8.3
(*)+25° 4'.	Oct. 11	3 16 27.39	9.2
65 Arietis, +20° 24'.	Feb. 8	3 17 20.49	
Weisse (2) 376, +37° 38'.	Sept. 2	3 19 29.09	7.2
Weisse (2) 393, +18° 19'.	Sept. 30	3 20 2.03	7.2
Lacaille 1102, −28° 55'.	Feb. 8	3 21 35.62	7.7
Rumker 870, +18° 21'.	Jan. 25	3 22 46.04	7.5
(*)+5° 28'.	Oct. 11	3 22 57.11	8.5
(*)+5° 31'.	Oct. 11	3 23 5.72	8.2
O. Arg. S. 2302, −18° 16'.	Sept. 2	3 23 45.75	9.0
	30	45.62	8.3
Lacaille 1114, −22° 54'.	Jan. 24	3 24 25.00	
(*)+46° 50'.	Oct. 23	3 25 38.01	8.5
7 Tauri, +24° 5'.	Jan. 25	3 27 9.71	6.0
(*)+31° 36'.	Sept. 2	3 27 21.57	6.0
	30	21.48	7.0
	Oct. 11	21.45	6.0
(*)+31° 17'.	Jan. 29	3 27 42.82	
	Feb. 8	42.82	8.2
(*)+31° 16'.	Jan. 29	3 27 59.09	
(*)+46° 50'.	Oct. 23	3 28 5.78	7.5
(*)+46° 50'.	Oct. 23	3 28 25.61	6.5
(*)+31° 15'.	Feb. 8	3 28 28.87	7.5
(*)+31° 37'.	Sept. 2	3 28 53.37	7.5
	30	53.42	8.3
B. A. C. 1105, +42° 12'.	Jan. 24	3 29 41.73	
B. A. C. 1111, +62° 50'.	Jan. 25	3 31 29.90	
12 Tauri, +2° 39'.	Sept. 30	3 33 26.85	6.0
	Oct. 11	26.80	5.5
	23	26.88	6.0
ο Persei, +33° 35'.	Jan. 24	3 34 34.99	
	25	35.05	
Weisse (2) 733, +26° 10'.	Sept. 2	3 35 4.58	
Wrisse (2) 750, +38° 0'.	Feb. 8	3 35 54.84	8.0
Weisse (2) 751, +38° 0'.	Feb. 8	3 35 57.29	8.2

(*)+20° 10'.

1877.		h.	m.	s.	Mag.
Jan.	29	3	38	57.63	9.5

(*)+23° 15'.

Jan.	24	3	39	17.34	
	25			17.10	
Feb.	8			17.04	7.5
Sept.	30			17.21	8.0
Oct.	23			17.32	7.5

(*)+23° 17'.

Jan.	24	3	40	0.07	
	25			0.24	

(*)+23° 21'.

Jan.	24	3	40	3.75	

(*)+24° 12'.

Jan.	26	3	40	4.08	7.5

(*)+24° 16'.

Jan.	26	3	40	6.20	8.8

(*)+23° 24'.

Jan.	24	3	40	9.29	
	25			9.50	

η TAURI, +23° 43'.

Sept.	2	3	40	10.47	
Oct.	11			10.52	

(*)+23° 14'.

Feb.	8	3	40	19.37	7.5

WEISSE (2) 931, +26° 42'.

Jan.	26	3	43	19.59	8.4
	29			19.36	8.7
Feb.	8			19.55	9.0

RADCLIFFE 1084, +40° 27'.

Sept.	30	3	43	48.53	
Oct.	23			48.52	7.0

(*)+27° 28'.

Oct.	11	3	44	25.96	8.0

(*)+75° 51'.

Jan.	24	3	45	29.74	

RUMKER 1023, +16° 17'.

Feb.	8	3	47	27.13	

(*)+75° 51'.

Jan.	24	3	48	10.98	

τ^6 ERIDANI, −25° 0'.

Feb.	19	3	48	28.78	
Oct.	23			28.62	5.0

LALANDE 7206, +34° 43'.

1877.		h.	m.	s.	Mag.
Sept.	30	3	48	33.29	6.0

(*)+75° 51'.

Jan.	24	3	48	43.74	

LALANDE 7220, +22° 48'.

Oct.	11	3	48	44.41	8.2

(*)+35° 37'.

Jan.	25	3	48	45.12	7.8

LALANDE 7238, +22° 50'.

Oct.	11	3	49	10.83	7.8

33 TAURI, +22° 50'.

Jan.	29	3	49	46.17	
Oct.	11			46.42	6.0

γ^1 ERIDANI, −13° 51'.

Jan.	25	3	52	17.41	
	26			17.49	
	29			17.47	
Feb.	8			17.41	
	19			17.54	
Sept.	30			17.45	
Oct.	23			17.43	

LALANDE 7391, +38° 47'.

Jan.	24	3	54	16.71	7.5

(*)+3° 50'.

Oct.	11	3	54	43.50	8.2

A^1 TAURI, +21° 40'.

Feb.	19	3	57	25.59	

A^2 TAURI, +21° 40'.

Jan.	24	3	58	3.36	
	26			3.65	
Feb.	8			3.42	7.0
	19			3.33	

(*)+21° 43'.

Jan.	24	3	58	4.47	
	29			4.36	7.7
Feb.	8			4.32	8.2

(*)+37° 48'.

Jan.	25	3	59	22.94	7.0

WEISSE (2) 1251, +41° 9'.

Oct.	11	3	59	54.51	7.5
	23			54.53	

50 PERSEI, +37° 46'.

Jan.	25	4	0	24.75	6.0

WEISSE (2) 1269, +41° 10'.

1877.		h.	m.	s.	Mag.
Oct.	11	4	0	32.17	6.0
	23			32.09	

(*)−31° 22'.

Feb.	8	4	0	44.65	8.0

ω^1 TAURI, +19° 19'.

Jan.	24	4	1	60.09	
	26			60.06	
Feb.	19			59.99	

(*)+16° 59'.

Oct.	23	4	4	37.22	8.5

RUMKER 1110, +16° 59'.

Oct.	23	4	5	28.17	6.0

(*)−6° 49'.

Jan.	29	4	6	55.54	6.5

46 TAURI, +7° 23'.

Feb.	19	4	6	55.76	

(*)−31° 38'.

Oct.	11	4	8	25.46	7.7

LALANDE 7987, +16° 17'.

Oct.	23	4	10	26.41	7.7

O. ARG. S. 2939, −22° 27'.

Jan.	29	4	10	34.19	7.3

51 TAURI, +21° 19'.

Feb.	8	4	11	6.36	6.5

WEISSE (2) 203, +17° 31'.

Oct.	11	4	11	33.37	8.0

WEISSE (2) 204, +17° 31'.

Oct.	11	4	11	33.59	9.0

γ TAURI, +15° 20'.

Jan.	24	4	12	47.69	
	25			47.73	
Feb.	14			47.72	
	15			47.68	
	17			47.68	
	19			47.64	

63 TAURI, +16° 30'.

Feb.	8	4	16	21.71	6.5

56 PERSEI, +33° 41'.

Jan.	29	4	16	39.11	6.0

WEISSE (2) 344, +16° 35'.

1877.		h.	m.	s.	Mag.
Jan.	26	4	17	24.25	
Feb.	10			24.50	7.0

(*)−25° 40'.

Jan.	25	4	18	13.06	7.3
Feb.	14			13.16	7.7
Oct.	11			13.03	7.0
	23			13.10	7.5

(*)+17° 13'.

Feb.	17	4	18	48.35	7.3

(*)+16° 28'.

Oct.	11	4	19	36.43	7.0
	23			36.62	7.7

B. A. C. 1374, −35° 2'.

Feb.	19	4	20	23.17	

ε TAURI, +18° 54'.

Jan.	24	4	21	26.16	
Feb.	10			26.20	
	13			26.11	
	17			26.09	

LACAILLE 1463, −32° 41'.

Feb.	15	4	22	58.38	7.3

(*)−32° 44'.

Feb.	15	4	23	55.03	

(*)+35° 39'.

Jan.	25	4	24	26.48	9.2

WEISSE (2) 506, +35° 35'.

Jan.	24	4	24	55.57	8.5
	25			55.38	8.5
	26			55.47	8.5
Feb.	8			(55.09)	
	10			55.68	8.3

B. A. C. 1404, −30° 43'.

Oct.	11	4	25	33.61	7.0
	23			33.62	6.5

(*)+22° 4'.

Jan.	26	4	28	45.95	9.0

α TAURI, +16° 16'.

Jan.	29	4	28	51.92	
Feb.	10			51.83	
	13			51.83	
	14			51.76	
	19			51.78	
	21			51.80	

(*)+27° 0'.

Feb.	15	4	29	8.62	

(*)+3° 49′.

1877.		h. m. s.	Mag.
Oct.	23	4 29 30.96	7.5

(*)+22° 4′.

Jan.	25	4 29 44.99	8.5
Feb.	17	44.86	8.7

Weisse (2) 634, +29° 10′.

Oct.	11	4 30 42.34	8.0

Weisse 646, +7° 6′.

Jan.	24	4 31 16.91	

(*)+33° 31′.

Jan.	26	4 33 5.53	9.0
Feb.	10	5.75	
	15	5.28	8.5
	17	5.47	

Weisse 725, +8° 2′.

Feb.	14	4 34 31.88	8.7
	19	31.87	

(*)−25° 53′.

Oct.	11	4 35 7.82	9.2

(*)−25° 53′.

Oct.	23	4 35 9.50	9.0

(*)−26° 00′.

Jan.	26	4 35 34.69	8.3
Feb.	15	34.40	8.2
	17	34.46	8.2

B. A. C. 1448, +80° 59′.

Jan.	25	4 37 23.77	
	29	24.82	
Feb.	8	24.28	
	13	23.09	

(*)+10° 43′.

Jan.	26	4 40 27.70	7.5

(*)+10° 42′.

Jan.	26	4 40 41.70	8.5

(*)+10° 43′.

Jan.	26	4 40 44.46	8.5

(*)+10° 43′.

Jan.	26	4 40 46.86	

(*)+10° 42′.

b.	14	4 41 12.76	

(*)+10° 45′.

1877.		h. m. s.	Mag.
Feb.	14	4 41 27.85	

(*)+10° 45′.

Feb.	10	4 41 37.12	
	19	37.16	8.2

(*)+10° 42′.

Feb.	21	4 41 37.68	

(*)+10° 42′.

Feb.	17	4 41 40.35	
	19	40.06	8.5

(*)+10° 43′.

Feb.	14	4 41 41.65	
	19	41.69	8.2
	21	41.76	
Oct.	11	41.70	
	23	41.80	8.6

(*)+10° 43′.

Feb.	14	4 41 41.85	
	17	41.94	

(*)+10° 43′.

Feb.	8	4 41 43.05	

(*)+10° 40′.

Oct.	11	4 41 44.05	
	23	44.06	8.0

(*)+10° 43′.

Feb.	21	4 41 44.42	

(*)+10° 43′.

Feb.	8	4 41 46.79	
	17	46.91	
	19	46.62	8.2
	21	46.68	
Oct.	11	46.61	
	23	46.76	8.0

(*)+10° 42′.

Feb.	17	4 41 48.79	

9 Camelopardi, +66° 7′.

Jan.	24	4 41 50.25	

(*)+10° 42′.

Feb.	17	4 41 57.31	

(*)−29° 58′.

Feb.	15	4 42 12.98	8.2

(*)+10° 46′.

1877.		h. m s.	Mag.
Feb.	14	4 42 38.76	
	19	38.76	
Oct.	11	38.77	
	23	38.58	8.5

(*)+10° 42′.

Feb.	17	4 42 38.95	7.2
	19	38.99	8.2

(*)+10° 42′.

Feb.	17	4 43 43.66	

Weisse 925, +1° 19′.

Feb.	21	4 44 7.37	
Oct.	23	7.42	8.0

Weisse IV, 926, +10° 46′.

Feb.	17	4 44 23.75	
	19	23.53	7.5

(*)+43° 52′.

Jan.	25	4 44 59.97	9.0
Feb.	10	60.19	8.0

Weisse 972, +1° 19′.

Feb.	13	4 45 50.61	8.0

Lalande 9106, +43° 51′.

Jan.	25	4 46 1.68	6.0
Feb.	8	1.58	6.5
	10	2.00	
	15	1.75	6.5

(*)+43° 54′.

Jan.	26	4 46 3.23	6.0

(*)+43° 47′.

Feb.	14	4 47 13.60	8.5
	15	13.51	8.5
Oct.	11	13.66	8.5

B. A. C. 1518, +24° 23′.

Jan.	29	4 48 46.01	

(*)+13° 22′.

Jan.	24	4 48 56.32	7.0

B. A. C. 1531, −25° 52′.

Feb.	8	4 50 27.93	7.2

(*)+37° 43′.

Oct.	11	4 50 54.44	8.5

4 Aurigæ, +37° 43′.

Oct.	11	4 50 54.48	5.5

(*)−25° 49′.

1877.		h. m. s.	Mag.
Jan.	25	4 51 22.47	9.0
Feb.	14	22.33	

(*)−25° 49′.

Feb.	15	4 51 40.63	9.5

(*)+38° 17′.

Oct.	23	4 52 38.67	7.5

(*)+38° 17′.

Oct.	23	4 52 46.69	

ε Aurigæ, +43° 38′.

Feb.	21	4 53 8.71	

64 Eridani, −12° 42′.

Jan.	29	4 54 12.75	

(*)+27° 35′.

Feb.	8	4 56 56.47	7.0
	14	56.68	7.0

(*)+23° 32′.

Jan.	26	4 56 57.01	7.0

(*)+27° 34′.

Feb.	8	4 57 19.31	8.5

11 Orionis, +15° 14′.

Jan.	24	4 57 32.50	
	29	32.58	
Oct.	11	32.54	

(*)+27° 33′.

Feb.	8	4 57 34.58	8.5

(*)+45° 6′.

Jan.	25	4 58 33.34	8.3
Feb.	13	33.58	8.0
	15	33.48	8.0
	17	33.57	

(*)−23° 48′.

Feb.	14	5 0 20.46	7.5
	19	20.19	
	21	20.38	8.2

Rumker 2553, +30° 9′.

Oct.	23	5 3 14.25	

(*)+30° 13′.

Jan.	26	5 3 58.27	
Feb.	14	58.16	9.0

O. Arg. S. 3720, −25° 30′.

Feb.	15	5 4 25.40	8.0
	21	25.81	8.8

1877.	h. m. s.	Mag.
(*)+30° 17′.		
Feb. 10 . .	5 4 44.64	8.5
μ Aurigæ, + 38° 20′.		
Jan. 29 . .	5 5 0.60	5.0
(*)+ 30° 17′.		
Feb. 13 . .	5 5 6.22	
Weisse 56, + 4° 12′.		
Feb. 17 . .	5 5 14.61	
Weisse 55, + 4° 16′.		
Feb. 17 . .	5 5 14.96	
(*)−25° 36′.		
Feb. 21 . .	5 5 16.11	9.0
(*)+ 30° 15′.		
Feb. 13 . .	5 5 53.76	
(*)−25° 33′.		
Feb. 19 . .	5 6 7.23	
(*)−25° 33′.		
Jan. 25 . .	5 6 9.85	9.3
Weisse (2) 111, + 30° 17′.		
Feb. 10 . .	5 6 22.67	7.5
14 . .	22.59	7.5
(*)+30° 15′.		
Feb. 10 . .	5 7 30.18	9.0
Weisse 136, −8° 16′.		
Oct. 23 . .	5 7 38.31	
(*)+30° 22′.		
Feb. 15 . .	5 8 1.24	7.2
17 . .	1 22	
β Orionis, − 8° 21′.		
Oct. 23 . .	5 8 37.62	
B. A. C. 1619, + 77° 51′.		
Jan. 26 . .	5 10 30.77	
Feb. 8 . .	31.04	6.0
13 . .	30.36	
14 . .	30.36	
21 . .	31.01	
B. A. C. 1641, − 35° 4′.		
Feb. 19 . .	5 11 21.96	6.5
o Columbæ, − 35° 0′.		
Feb. 19 . .	5 13 2.97	

1877.	h, m. s.	Mag.
(*)− 25° 21′.		
Feb. 10 . .	5 14 (40.90)	8.0
14 . .	41.64	8.5
15 . .	41.68	8.5
17 . .	41.47	
(*)+77° 50′.		
Feb. 19 . .	5 17 5.00	8.0
Weisse (2) 430, + 37° 55′.		
Feb. 21 . .	5 17 13.72	8.3
Weisse (2) 431, + 37° 55′.		
Feb. 21 . .	5 17 13.93	8.0
β Tauri, + 28° 30′.		
Jan. 25 . .	5 18 31.05	
29 . .	30.82	
Feb. 8 . .	31.08	
(*)+38° 58′.		
Feb. 15 . .	5 18 58.68	9.2
(*)+ 38° 57′.		
Feb. 15 . .	5 19 15.27	9.0
(*)+38° 43′.		
Feb. 10 . .	5 20 44.40	
(*)+38° 44′.		
Feb. 17 . .	5 21 1.88	
(*)+54° 35′.		
Feb. 21 . .	5 21 24.04	8.0
(*)+38° 58′.		
Feb. 15 . .	5 21 24.33	
(*)−32° 35′.		
Feb. 14 . .	5 21 38.16	
(*)+20° 27′.		
Feb 8 . .	5 21 39.36	8.5
13 . .	39.53	7.0
(*)−32° 29′.		
Feb. 19 . .	5 23 16.11	6.5
χ Aurigæ, + 32° 7′.		
Jan. 25 . .	5 24 43.31	5.0
δ Orionis, − 0° 23′.		
Jan. 26 . .	5 25 43.39	
Feb. 8 . .	43.44	
21 . .	43.40	
Weisse 603, − 0° 22′.		
Jan. 26 . .	5 25 43.47	
Feb. 21 . .	43.40	

1877.	h. m. s.	Mag.
(*)−5° 36′.		
Feb. 19 . .	5 27 49.55	9.5
(*)−13° 16′.		
Feb. 17 . .	5 28 1.29	8.5
ε Orionis, − 1° 17′.		
Jan. 26 . .	5 29 58.23	
Feb. 10 . .	58.21	
21 . .	58.39	
B. A. C. 1751, + 65° 37′.		
Jan. 25 . .	5 30 7.08	
Feb. 13 . .	6.85	
(*)+25° 56′.		
Feb. 19 . .	5 30 14.65	8.0
(*)+25° 32′.		
Feb. 14 . .	5 30 19.42	9.0
(*)+70° 18′.		
Feb. 17 . .	5 33 24.64	
O Arg. N. 6082, + 70° 14′.		
Feb. 17 . .	5 33 38.23	
(*)+38° 16′.		
Jan. 25 . .	5 35 4.77	8.0
(*)+38° 11′.		
Feb. 10 . .	5 35 36.68	7.5
13 . .	36.51	
15 . .	36.46	
19 . .	36.52	8.0
21 . .	36.60	
(*)+38° 11′.		
Feb. 13 . .	5 35 47.84	
15 . .	47.78	9.0
19 . .	47.85	8.5
21 . .	47.84	
(*)+38° 12′.		
Feb. 10 . .	5 35 50.06	8.5
(*)+38° 7′.		
Feb. 13 . .	5 36 35.93	
(*)+38° 6′.		
Feb. 10 . .	5 37 50.20	8.0
13 . .	50.03	
17 . .	50.02	
21 . .	49.97	
(*)+38° 7′.		
Feb. 17 . .	5 38 36.75	
(*)+38° 7′.		
Feb. 13 . .	5 38 44.67	

1877.	h. m. s.	Mag.
(*)+38° 5′.		
Feb. 10 . .	5 38 46.87	8.2
(*)+38° 7′.		
Jan. 25 . .	5 39 7.52	8.3
Feb. 10 . .	7.78	
13 . .	7.43	
15 . .	7.39	8.5
17 . .	7.59	
B. A. C. 1860, − 23° 1′.		
Feb. 15 . .	5 44 45.45	6.0
(*)+20° 17′.		
Feb. 21 . .	5 45 46.52	
Weisse 1143, − 13° 45′.		
Jan. 25 . .	5 45 57.63	
B. A. C. 1867, + 20° 16′.		
Feb. 21 . .	5 46 0.37	7.0
Lacaille 2023, −25° 15′.		
Feb. 17 . .	5 46 53.88	
α Orionis, + 7° 23′.		
Feb. 14 . .	5 48 30.89	
15 . .	30.82	
Mar. 15 . .	30.88	
(*)+7° 18′.		
Feb. 13 . .	5 50 4.11	8.5
(*)−29° 56′.		
Feb. 10 . .	5 50 25.23	
(*)−29° 56′.		
Feb. 17 . .	5 50 53.13	7.5
19 . .	53.27	
(*)−29° 56′.		
Feb. 17 . .	5 50 55.09	7.5
19 . .	54.79	
(*)+7° 20′.		
Jan. 25 . .	5 51 9.84	9.0
(*)+7° 22′.		
Feb. 13 . .	5 51 13.85	8.5
(*)−32° 0′.		
Feb. 21 . .	5 52 13.73	
B. A. C. 1935, + 37° 58′.		
Feb. 19 . .	5 56 36.35	6.0
Weisse 1479, − 14° 6′.		
Feb. 13 . .	5 58 36.32	

Weisse 1487, – 14° 0′.

1877.		h.	m.	s.	Mag.
Feb.	13	5	58	58.56	

Weisse 1500, – 14° 6′.

Feb.	13	5	59	17.12	

(*)+20° 7′.

Feb.	15	5	59	24.11	8.5

(*)+20° 8′.

Feb.	15	6	0	2.10	9.0
	21			2.06	8.0

(*)+37° 58′.

Feb.	17	6	0	5.91	
	19			5.79	9.0

(*)+20° 12′.

Feb.	10	6	0	19.22	
	21			19.27	8.5

(*)+31° 26′.

Feb.	15	6	2	27 14	
	21			27.22	8.5

(*)+31° 23′.

Feb.	21	6	2	43.81	8.5

(*)–26° 42′.

Feb.	17	6	6	47.60	
	19			48.08	9.0

(*)–26° 42′.

Feb.	17	6	6	51.44	
	19			51.38	8.0

B. A. C. 2021, +35° 15′.

Feb.	19	6	10	39.90	

Weisse 428, –14° 15′.

Feb.	17	6	15	38.89	8.0

Weisse 446, –14° 20′.

Feb.	19	6	16	4.33	

47 Aurigæ, +46° 46′.

Jan.	25	6	20	51.76	

B. A. C. 2069, +78° 5′.

Feb.	10	6	21	21.60	
	13			21.03	
	14			20.61	

B. A. C. 2100, –25° 45′.

Feb.	15	6	22	14.03	6.7
	21			14.02	7.0

(*)–25° 45′.

1877.		h.	m.	s.	Mag.
Feb.	15	6	22	43.58	9.0
	17			43.62	8.3
	19			43.51	
	21			43.74	9.0

(*)–25° 48′.

Feb.	21	6	22	43.68	8.0

O. Arg. S. 5176, –25° 48′.

Feb.	17	6	24	9.96	8.0
	21			10.00	

(*)+28° 7′.

Jan.	25	6	25	56.84	

49 Aurigæ, +28° 7′.

Jan.	25	6	27	27.19	
Feb.	14			27.38	
	21			27.18	
Mar.	23			27.29	

γ Geminorum, +16° 30′.

Jan.	25	6	30	36.38	
Feb.	10			36.47	
	13			36.48	
	14			36.37	
	15			36.38	
	17			36.51	
	19			36.42	
Mar.	15			36.36	
	23			36.42	

(*)–32° 4′.

Feb.	21	6	32	24.73	

Weisse (2) 1043, +36° 17′.

Feb.	15	6	35	55.02	8.3
	21			55.18	8.2

Weisse (2) 1044, +36° 15′.

Feb.	15	6	35	56.01	7.3
	21			56.22	6.5

O. Arg. S. 5522, –27° 37′.

Feb.	13	6	36	51.10	8.0

(*)–23° 32′.

Mar.	15	6	37	52.83	9.0

42 Camelopardi, +67° 43′.

Feb.	10	6	38	7.41	
	17			7.21	
Mar.	23			7.13	
	24			7.23	

(*)–23° 22′.

Mar.	15	6	38	59.42	

B. A. C. 2210, +77° 8′.

1877.		h.	m.	s.	Mag.
Feb.	17	6	42	5.76	
	21			5.88	
Mar.	15			6.24	

(*) – 28° 35′.

Feb.	15	6	43	54.15	

Groombridge 1241, +38° 4′.

Feb.	21	6	47	9.15	7.5

B. A. C. 2247, +70° 59′.

Feb.	14	6	47	21.95	
Mar.	15			22.30	6.5

(*)–24° 15′.

Feb.	15	6	48	25.89	9.5

(*)–24° 13′.

Feb.	15	6	48	34.94	8.0

(*)–38° 50′.

Feb.	17	6	49	19.78	
	19			19.90	

(*)–30° 43′.

Feb.	15	6	52	17.48	8.8

(*)–30° 43′.

Feb.	13	6	52	51.30	

ε Canis Majoris, –28° 48′.

Mar.	24	6	53	47.53	
	30			47.57	

(*)–20° 26′.

Mar.	23	6	55	16.78	7.0

(*)–20° 28′.

Mar.	23	6	55	23.05	6.5

(*) – 20° 26′.

Feb.	19	6	56	12.24	

44 Geminorum, +22° 53′.

Feb.	13	6	57	54.16	

(*)+22° 53′.

Feb.	13	6	58	23.34	

(*)–14° 42′.

Feb.	14	7	1	48.44	
	21			48.25	9.0

B. A. C. 2317, +81° 29′.

1877.		h.	m.	s.	Mag.
Feb.	15	7	1	55.41	
	17			56.54	
	19			56.97	
Mar.	15			57.73	

(*)–14° 42′.

Feb.	14	7	2	44.12	

(*)–14° 42′.

Feb.	13	7	2	48.17	
	14			48.44	

(*)–14° 42′.

Feb.	13	7	2	55.37	
	14			55.67	
	21			55.71	9.0

δ Canis Majoris, –26° 12′.

Mar.	23	7	3	23.46	
	24			23.52	
	30			23.47	

(*)–14° 44′.

Feb.	21	7	7	24.75	8.0

(*)+41° 45′.

Mar.	15	7	9	32.89	9.0

(*)–23° 30′.

Feb.	15	7	10	23.21	8.2
	21			23.47	8.5

Lacaille 2684, –23° 34′.

Feb.	15	7	10	37.76	7.0
	21			37.89	6.5

B. A. C. 2377, +81° 8′.

Feb.	13	7	12	10.45	6.0
	14			9.31	
Mar.	23			10.02	
	24			9.69	
	30			10.90	

δ Geminorum, +22° 12′.

Feb.	17	7	12	46.61	
	19			46.54	

(*)–24° 41′.

Feb.	17	7	16	2.10	7.0

(*)–14° 38′.

Mar.	15	7	17	12.00	9.0

O. Arg. S. 6696, –24° 41′.

Feb.	17	7	17	16.97	
	19			17.03	7.5

1877.		h.	m.	s.	Mag.
(*)−35° 41′.					
Feb.	15	7	17	49.96	8.3
(*)−35° 44′.					
Feb.	15	7	17	50.27	7.8
(*)−24° 43′.					
Mar.	20	7	18	22.52	
O. Arg. S. 6728, −24° 41′.					
Feb.	14	7	18	23.45	
	19			23.31	7.5
O. Arg. S. 6754, −18° 46′.					
Feb.	13	7	19	18.97	8.5
O. Arg. S. 6762, −18° 46′.					
Feb.	13	7	19	25.69	6.5
Lalande 14473, +41° 5′.					
Mar.	24	7	21	43.19	7.0
(*)+40° 42′.					
Feb.	15	7	22	27.24	8.3
Weisse (2) 594, +40° 42′.					
Feb.	13	7	22	35.39	8.0
Weisse (2) 625, +40° 42′.					
Feb.	15	7	23	31.91	8.2
(*)--14° 46′.					
Feb.	17	7	23	33.75	
	19			33.63	8.5
Lalande 14619, −14° 44′.					
Feb.	19	7	23	46.07	6.5
(*)+22° 32′.					
Feb.	14	7	24	0.57	8.3
(*)−20° 32′.					
Mar.	15	7	25	6.37	7.0
Weisse (2) 730, +41° 43′.					
Feb.	15	7	26	51.48	
	17			51.45	
	21			51.50	
Mar.	20			51.45	
	23			51.47	9.0
	24			51.49	7.5
Weisse (2) 840, +21° 40′.					
Feb.	14	7	29	56.14	8.0
	19			56.06	7.5
	21			56.17	8.0
Mar.	15			56.10	7.5
Weisse (2) 874, +21° 44′.					
Feb.	21	7	30	59.77	8.2
Mar.	30			59.53	8.2
(*)−23° 32′.					
Mar.	20	7	31	3.19	8.0
(*)−31° 3′.					
Feb.	15	7	31	46.94	
	17			47.01	
Lacaille 7876, −23° 29′.					
Feb.	13	7	32	5.06	6.5
Mar.	20			4.92	7.0
(*)−31° 3′.					
Feb.	15	7	32	6.30	
	17			6.37	
(*)+15° 34′.					
Feb.	14	7	34	9.93	8.5
(*)+10° 24′.					
Mar.	15	7	34	20.06	8.0
(*)−14° 21′.					
Feb.	19	7	34	53.74	
O. Arg. S. 7286, −29° 55′.					
Mar.	23	7	37	15.03	
O. Arg. S. 7296, −29° 57′.					
Mar.	15	7	37	27.70	8.0
	23			27.89	
	30			27.94	
β Geminorum, + 28° 19′.					
Feb.	13	7	37	47.27	
	14			47.27	
	15			47.28	
	17			47.22	
	21			47.25	
Lalande 15079, − 11° 0′.					
Feb,	19	7	38	12.50	
(*)+38° 20′.					
Feb.	21	7	41	30.54	8.0
Mar.	20			30.62	8.0
(*)+38° 9′.					
Feb.	13	7	42	50.12	8.2
	15			50.04	9.0
(*)−23° 27′.					
Mar.	24	7	42	52.52	8.5
(*)−29° 50′.					
Mar.	15	7	42	57.49	8.3
(*)+0° 26′.					
Mar.	20	7	44	34.66	7.2
B. A. C. 2596, + 74° 15′.					
Mar.	24	7	45	26.12	6.0
	30			26.45	
(*)+0° 28′.					
Feb.	15	7	45	54.67	9.0
(*)+0° 27′.					
Feb.	15	7	45	57.24	9.0
φ Geminorum, +27° 5′.					
Feb.	13	7	45	58.08	
	21			58.16	
Mar.	15			58.03	
(*)+ 0° 30′.					
Feb.	19	7	47	19.60	
(*)+44° 18′.					
Mar.	20	7	49	38.15	7.0
	24			38.15	6.5
(*)−30° 32′:					
Feb.	15	7	51	32.50	8.0
	19			32.55	8.2
(*)+60° 45′.					
Mar.	15	7	51	57.65	
(*)+60° 45′.					
Mar.	30	7	54	5.61	8.3
(*)−30° 1′.					
Feb.	19	7	54	5.59	
O. Arg. S. 7797, −30° 05′.					
Feb.	15	7	54	54.73	7.5
	19			54.78	
O. Arg. S. 7798, -- 30° 1′.					
Feb.	15	7	55	2.38	8.0
	19			2.37	
(*)+28° 57′.					
Mar.	15	7	59	39.61	8.0
	20			39.69	8.0
(*)+14° 43′.					
Mar.	24	8	0	12.75	8.0
Weisse (2) 1642, +28° 57′.					
Mar.	15	8	0	42.34	
(*)+20° 55′.					
Mar.	30	8	1	0.59	8.4
ρ Argus, − 23° 57′.					
Feb.	15	8	2	18.45	
	19			18.49	
April	5			18.48	
	6			18.51	
	11			18.49	
B. A. C. 2732, + 56° 49′.					
Mar.	15	8	4	1.42	6.5
	24			1.49	6.0
B. A. C. 2749, + 72° 45′.					
Feb.	15	8	7	4.95	
	19			4.86	
April	5			5.08	7.0
	6			4.70	
(*)−30° 11′.					
Mar.	24	8	10	48.46	9.0
(*)−30° 13′.					
Mar.	24	8	10	51.16	9.0
(*)−30° 13′.					
Mar.	24	8	10	51.86	8.0
Lacaille 3249, —25° 58′.					
Mar.	15	8	13	8.81	7.2
	20			9.16	
(*)−29° 46′.					
April	6	8	14	48.44	9.9
(*)−30° 34′.					
Mar.	24	8	15	8.16	
(*)−30° 34′.					
April	5	8	15	12.41	
(*)−30° 34′.					
Mar.	30	8	15	13.41	8.5
Lalande 16413, +25° 24′.					
April	11	8	17	12.20	7.5
(*)+40° 21′.					
Mar.	15	8	18	5.94	8.5
(*)+40° 21′.					
April	5	8	18	35.53	8.6
Weisse (2) 381, + 40° 21′.					
Mar.	24	8	18	36.13	8.5
	30			36.16	

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Weisse (2) 382, +40° 21′.		
Mar. 15 . .	8 18 36.47	7.0
20 . .	36.59	7.7
24 . .	36.42	7.7
30 . .	36.71	
April 5 . .	36.41	8.0
(*)+17° 31′.		
April 6 . .	8 18 45.42	
Weisse (2) 408, +40° 21′.		
Mar. 24 . .	8 19 36.26	8.0
(*)+40° 21′.		
Mar. 30 . .	8 19 44.90	
Weisse (2) 438, +40° 21′.		
Mar. 15 . .	8 20 34.92	8.3
April 5 . .	35.06	
B. A. C. 2830, +82° 40′.		
Mar. 20 . .	8 23 58.21	
24 . .	57.17	7.0
30 . .	59.64	
Weisse (2) 579, +31° 18′.		
Mar. 15 . .	8 26 23.63	8.0
April 5 . .	23.60	
6 . .	23.54	
(*)+24° 30′.		
Mar. 30 . .	8 28 46.20	
(*)+27° 34′.		
April 6 . .	8 29 19.44	9.0
π Ursæ Majoris, +64° 46′.		
Mar. 20 . .	8 29 26.79	
23 . .	26.78	
24 . .	26.48	5.0
(*)−24° 40′.		
April 7 . .	8 30 9.34	7.5
11 . .	9.46	7.0
(*)+24° 30′.		
April 5 . .	8 30 28.55	8.5
Weisse 792, +6° 50′.		
Mar. 15 . .	8 31 43.36	8.0
(*)+20° 8′.		
April 6 . .	8 33 16.95	7.5
B. A. C. 2919, +20° 6′.		
April 6 . .	8 33 18.30	8.0

1877.	h. m. s.	Mag.
(*)+19° 40′.		
Mar. 30 . .	8 33 30.52	8.3
(*)+19° 40′.		
Mar. 30 . .	8 33 36.68	
42 Cancri, +20° 8′.		
April 6 . .	8 33 39.39	7.5
(*)−33° 35′.		
April 11 . .	8 33 51.83	8.5
Weisse 885, −14° 15′.		
Mar. 15 . .	8 34 38.78	7.0
24 . .	39.14	7.5
Lacaille 3459, −33° 35′.		
April 11 . .	8 34 57.34	7.5
(*)−33° 35′.		
April 11 . .	8 35 10.10	7.5
b Mali, −34° 53′.		
April 7 . .	8 35 17.40	
Weisse (2) 856, +43° 7′.		
April 5 . .	8 35 24.88	
(*)+14° 7′.		
April 6 . .	8 36 23.02	8.0
Weisse 936, +14° 7′.		
Mar. 24 . .	8 37 4.07	8.2
O. Arg. S. 8946, −27° 7′.		
Mar. 15 . .	8 40 7.54	
April 5 . .	7.90	8.5
ε Hydræ, +6° 52′.		
Mar. 23 . .	8 40 15.68	
30 . .	15.76	
April 12 . .	15.74	
Weisse (2) 1024, +27° 17′.		
April 11 . .	8 42 17.39	8.0
Weisse (2) 1051, +27° 17′.		
April 11 . .	8 43 26.11	
O. Arg. S. 9040, − 24° 7′.		
April 7 . .	8 44 36.23	8.5

1877.	h. m. s.	Mag.
Lacaille 3552, −29° 54′.		
April 5 . .	8 45 8.35	7.5
B. A. C. 3015, +17° 50′.		
Mar. 20 . .	8 46 16.13	
23 . .	15.97	6.0
Lacaille 3574, −32° 2′.		
Mar. 15 . .	8 47 24.60	6.0
24 . .	24.75	7.0
(*)−32° 6′.		
Mar. 15 . .	8 47 48.01	7.3
24 . .	48.06	8.0
(*)−32° 57′.		
April 11 . .	8 50 5.28	
Lacaille 3595, −32° 57′.		
April 11 . .	8 50 25.80	
Weisse 1274, −7° 28′.		
April 12 . .	8 50 25.98	
Weisse (2) 1255, +23° 13′.		
April 14 . .	8 51 54.27	
Weisse (2) 1258, +23° 15′.		
April 14 . .	8 52 0.29	
B. A. C. 3042, +81° 20′.		
Mar. 15 . .	8 52 42.19	
20 . .	42.46	
23 . .	41.83	
April 6 . .	42.59	
7 . .	41.61	6.0
(*)−34° 49′.		
April 12 . .	8 54 19.42	8.5
(*)−34° 49′.		
April 11 . .	8 55 6.79	
Weisse (2) 1324, +38° 20′.		
Mar. 24 . .	8 55 38.62	7.0
April 5 . .	38.54	7.2
τ Ursæ Majoris, +64° 2′.		
Mar. 20 . .	9 0 45.64	
30 . .	45.72	
April 6 . .	45.52	
κ Cancri, +11° 0′.		
Mar. 23 . .	9 1 5.06	
24 . .	5.10	
April 5 . .	5.00	
11 . .	4.94	
12 . .	5.03	
14 . .	4.97	

1877.	h. m. s.
(*)−23° 35′.	
April 5 . .	9 6 29.91
O. Arg. S. 9450, −23° 35′.	
Mar. 15 . .	9 6 31.12
April 11 . .	31.51
θ Hydræ, +2° 50′.	
April 14 . .	9 7 57.93
Weisse 153, +5° 38′.	
Mar. 24 . .	9 9 11.72
30 . .	11.63
38 Lyncis (2d *), +37° 20′.	
April 14 . .	9 11 11.02
B. A. C. 3182 (1st *), +50°	
Mar. 23 . .	9 14 8.13
B. A. C. 3182 (2d *), +50°	
Mar. 15 . .	9 14 8.67
20 . .	8.80
Weisse (2) 271, +15° 53′.	
Mar. 24 . .	9 14 27.79
30 . .	27.70
(*)−28° 43′.	
April 11 . .	9 14 53.85
(*)−34° 49′.	
April 5 . .	9 16 7.67
B. A. C. 3202, +8° 14′.	
April 14 . .	9 16 56.83
Lacaille 3815, −38° 53′.	
Mar. 15 . .	9 19 23.03
23 . .	23.37
April 11 . .	23.48
α Hydræ, −8° 8′.	
Mar. 30 . .	9 21 32.52
April 5 . .	32.59
6 . .	32.67
Lacaille 3874, −32° 43′.	
April 11 . .	9 24 31.80
O. Arg. S. 9789, −29° 35′.	
April 5 . .	9 24 50.30
12 . .	50.21
(*)−35° 22′.	
April 14 . .	9 26 4.60
B. A. C. 3255, +28° 56′.	
Mar. 15 . .	9 26 5.80
23 . .	5.92

1877.		h. m. s.	Mag.
(*)−31° 29′.			
April	14	9 28 14.22	
O. Arg. S. 9855, −31° 22′.			
Mar.	24	9 28 42.08	
April	14	42.23	
O. Arg. S. 9856, −31° 26′.			
Mar.	24	9 28 44.28	
April	12	44.09	7.5
	14	44.22	
(*)−23° 52′.			
April	14	9 31 0.99	9.0
(*)−23° 52′.			
April	14	9 31 18.59	9.0
B. A. C. 3275, +78° 42′.			
Mar.	15	9 31 29.08	6.0
	23	28.58	
	30	29.11	
(*)−23° 52′.			
April	5	9 31 52.30	7.7
(*)−23° 52′.			
April	5	9 31 59.54	
O. Arg. S. 9938, −23° 52′.			
April	12	9 32 16.52	
B. A. C. 3284, +79° 42′.			
Mar.	24	9 32 36.28	
April	7	36.33	
	11	35.94	
28 Ursæ Majoris, +64° 14′.			
Mar.	23	9 36 26.53	
April	12	26.43	
	14	26.45	7.0
ε Leonis, +24° 26′.			
Mar.	15	9 38 52.07	
	24	51.99	
	30	52.12	
April	6	52.07	
(*)−40° 36′.			
April	11	9 40 10.55	8.0
(*)+25° 7′.			
Mar.	23	9 41 42.57	7.0
	24	42.51	7.5
(*)+25° 8′.			
Mar.	23	9 43 10.96	6.5
	24	10.95	6.5
(*)−39° 0′.			
April	14	9 44 1.04	8.2

1877.		h. m. s.	Mag.
(*)+18° 5′.			
April	5	9 44 52.39	7.5
	11	52.39	
	12	52.57	7.5
μ Leonis, +26° 35′.			
Mar.	15	9 45 45.96	
April	6	45.82	
B. A. C. 3376, +73° 29.			
Mar.	23	9 47 20.63	
	24	20.60	
April	7	20.66	6.0
Lacaille 4058, −27° 27′.			
April	14	9 48 33.29	7.5
(*)−34° 43′.			
April	11	9 54 27.26	8.5
(*)−34° 43′.			
April	14	9 54 54.67	
(*)+13° 28′.			
Mar.	23	9 56 35.39	8.5
(*)+13° 28′.			
Mar.	24	9 57 1.51	
Lacaille 4120, −32° 38′.			
April	5	9 57 58.75	6.5
	11	58.98	6.5
Weisse (2) 1255, +30° 6′.			
April	14	10 0 5.09	7.8
Weisse (2) 1257, +30° 3′.			
April	14	10 0 7.61	9.0
Weisse (2) 1259, +39° 15′.			
Mar.	23	10 0 16.67	8.0
	24	16.66	8.2
α Leonis, +12° 34′.			
April	11	10 1 49.27	
Weisse 38, −6° 47′.			
Mar.	24	10 4 44.59	7.5
(*)+32° 7′.			
Mar.	23	10 6 10.44	
Lalande 19869, +32° 3′.			
April	7	10 7 6.29	

1877.		h. m. s.	Mag.
32 Ursæ Majoris, +65° 43′.			
April	5	10 9 4.75	
(*)−3° 28′.			
April	11	10 12 59.77	
γ¹ Leonis, +20° 28′.			
Mar.	23	10 13 11.35	
	24	11.35	
April	5	11.36	
	12	11.38	
	14	11.37	
24 Sextantis, −0° 16′.			
April	5	10 17 10.52	
	14	10.63	
(*)+64° 55′.			
April	5	10 22 38.36	8.0
	11	38.25	8.2
(*)−35° 33′.			
April	12	10 22 44.12	8.0
	14	44.42	
B. A. C. 3593, +76° 21′.			
April	11	10 24 35.81	6.0
Lalande 20482, −10° 28′.			
April	5	10 28 30.32	8.0
	11	30.42	8.0
B. A. C. 3629, +81° 4′.			
April	5	10 31 14.57	6.5
B. A. C. 3652, +69° 43′.			
April	5	10 34 13.55	
l Leonis, +11° 12′.			
April	12	10 42 47.49	
May	15	47.46	
O. Arg. N. 11176, +62° 48′.			
April	5	10 44 49.48	8.5
	11	50.22	8.3
(*)−23° 40′.			
April	12	10 47 50.30	8.0
(*)−31° 8′.			
April	11	10 49 22.10	8.8
B. A. C. 3747, +78° 26′.			
April	5	10 50 3.34	6.0

1877.		h. m. s.	Mag.
(*)+12° 33′.			
April	11	10 52 58.53	8.5
Weisse 1076, +10° 52′.			
April	11	11 0 58.20	9.0
	12	58 15	
(*)−32° 53′.			
April	5	11 1 20.64	7.5
Lacaille 4624 (1st *), −28° 55′.			
April	11	11 4 1.63	
Lacaille 4624 (2d *), −28° 55′.			
April	11	11 4 2.50	
δ Leonis, +21° 12′.			
April	5	11 7 33.89	
	12	33.95	
Weisse 133, −2° 47′.			
April	11	11 9 55.38	7.7
δ Crateris, −14° 7′.			
April	5	11 13 11.62	
B. A. C. 3864, +65° 1′.			
April	11	11 15 31.74	6.0
May	15	31.79	6.0
	18	31.77	6.5
B. A. C. 3901, −1° 0′.			
April	11	11 21 36.61	
τ Leonis, + 3° 32′.			
May	15	11 21 36.72	
	18	36.73	
Weisse 347, + 3° 31′.			
May	15	11 21 37.53	
λ Draconis, + 70° 1′.			
April	5	11 24 5.14	
(*)+36° 57′.			
April	11	11 24 36.66	7.3
Lalande 21902, + 36° 57′.			
April	11	11 25 38.14	6.5
May	15	37.97	7.0
	18	38.14	7.2
υ Leonis, —0° 8′.			
April	11	11 30	

1877.	h. m. s.	Mag.
3 Draconis, + 67° 31′.		
May 18 . .	11 35 35.68	
Rumker 3697, + 22° 55′.		
April 11 . .	11 35 41.84	6.0
O. Arg. S. 11656, – 25° 16′.		
April 11 . .	11 41 7.88	7.0
(*)–25° 18′.		
April 11 . .	11 41 29.96	8.3
May 15 . .	29.84	
(*)–25° 16′.		
May 18 . .	11 42 23.41	8.3
(*)–25° 14′.		
May 15 . .	11 42 40.37	
B. A. C. 4009, — 30° 7′.		
April 11 . .	11 45 28.61	
B. A. C. 4021, + 5° 34′.		
May 18 . .	11 47 46.00	
B. A. C. 4036, + 62° 15′.		
May 15 . .	11 50 27.69	6.0
Weisse 921, + 8° 38′.		
May 15 . .	11 54 43.29	8.2
Weisse 947, + 8° 34′.		
May 15 . .	11 56 27.70	8.5
o Virginis, + 9° 25′.		
April 11 . .	11 58 56.58	
May 18 . .	56.60	
(*)–27° 17′.		
April 11 . .	12 2 10.61	8.2
Weisse 114, – 9° 35′.		
April 11 . .	12 10 15.40	
η Virginis, + 0° 1′.		
May 15 . .	12 13 36.83	
B. A. C. 4153, + 27° 19′.		
May 18 . .	12 14 8.53	6.0
Weisse 221, + 8° 34′.		
April 11 . .	12 15 13.37	
(*)–37° 19′.		
April 11 . .	12 22 21.30	8.0
(*)–37° 16′.		
April 11 . .	12 22 23.80	8.5

1877.	h. m. s.	Mag.
O. Arg. S. 12246, — 22° 50′.		
April 11 .	12 27 37.56	
6 Draconis, + 70° 42′.		
May 15 . .	12 29 31.27	
18 . .	30.90	
Weisse 498, – 2° 52′.		
April 11 . .	12 31 13.26	
γ¹ Virginis, – 0° 44′.		
April 11 . .	12 35 25.72	
γ² Virginis, –0° 44′.		
April 11 . .	12 35 25.68	
10 Canum Venat., + 39° 57′.		
May 15 . .	12 39 9.92	
18 . .	9.87	
11 Canum Venat., + 49° 8′.		
April 11 . .	12 43 1.99	
May 15 . .	1.92	
18 . .	1.90	
B. A. C. 4331, – 43° 29′.		
April 11 . .	12 48 7.76	
May 18 . .	7.90	
(*)+69° 22′.		
April 11 . .	12 53 36.29	
Groombridge 1947, + 69° 26′.		
April 11 . .	12 54 23.53	
θ Virginis, – 4° 53′.		
April 11 . .	13 3 35.01	
May 15 . .	34.99	
18 . .	35.00	
α Virginis, – 10° 31′.		
May 15 . .	13 18 42.91	
18 . .	42.95	
June 19 . .	43.01	
Weisse 566, – 8° 1′.		
May 18 . .	13 34 7.54	
Weisse 569, – 8° 1′.		
May 18 . .	13 34 30.06	
Weisse 630, – 12° 20′.		
May 18 . .	13 37 44.28	
Weisse 654, – 12° 20′.		
May 18 . .	13 39 16.66	

1877.	h. m. s.	Mag.
O. Arg. S. 13159, –20° 4′.		
May 18 . .	13 42 12.40	7.2
Lacaille 5710, –23° 45′.		
June 19 . .	13 44 34.09	6.5
20 . .	34.17	
η Bootis, +19° 1′.		
June 19 . .	13 48 49.64	
20 . .	49.70	
(*)–37° 47′.		
May 18 . .	13 49 31.27	8.0
B. A. C. 4671, –26° 48′.		
June 19 . .	13 55 23.32	
Weisse 992, +2° 10′.		
May 18 . .	13 57 46.51	9.2
Lacaille 5821, –34° 20′.		
June 19 . .	14 0 30.87	7.5
B. A. C. 4714, +32° 53′.		
June 19 . .	14 5 53.13	6.0
α Bootis, +19° 19′.		
May 18 . .	14 10 3.05	
Weisse 173, –5° 23′.		
June 19 . .	14 11 30.06	7.5
Weisse 257, –4° 44′.		
May 18 . .	14 15 51.42	
June 19 . .	51.27	9.0
O. Arg. S. 13626, –27° 21′.		
June 19 . .	14 20 11.58	
O. Arg. S. 13629, –27° 20′.		
June 19 . .	14 20 20.42	
(*)–34° 8′.		
June 19 . .	14 25 42.69	8.0
23 . .	43.01	8.0
(*)–34° 6′.		
June 19 . .	14 25 44.90	7.5
23 . .	44.96	8.0
5 Ursæ Minoris, +76° 15′.		
June 16 . .	14 27 48.57	
(*)+37° 41′.		
June 19 . .	14 29 12.95	8.0

1877.	h. m. s.	M
(*)+37° 42′.		
June 23 . .	14 29 27.13	
ζ Bootis, +14° 16′.		
June 19 . .	14 35 16.42	5
Weisse (2) 752, +38° 42′.		
June 23 . .	14 36 4.26	7
ε Bootis, +27° 36′.		
June 23 . .	14 39 36.94	
Weisse (2) 932, +36° 34′.		
June 23 . .	14 43 49.73	8
α² Libræ, –15° 32′.		
June 16 . .	14 44 4.63	
19 . .	4.59	
July 6 . .	4.62	
Weisse 936, +36° 34′.		
June 23 . .	14 44 5.63	
β Ursæ Minoris, +74° 39′.		
June 16 . .	14 51 4.99	
(*)+10° 25′.		
June 23 . .	14 56 59.56	
(*)+10° 24′.		
June 16 . .	14 57 46.04	
B. A. C. 4982, +83° 1′.		
July 6 . .	14 58 45.55	
7 . .	44.64	
Weisse 1091, –10° 42′.		
June 19 . .	14 59 24.91	
23 . .	24.97	
(*)–37° 0′.		
June 23 . .	15 2 25.80	
Lacaille 6261, –37° 2′.		
June 19 . .	15 4 56.40	
23 . .	56.17	
B. A. C. 5001, +29° 44′.		
July 4 . .	15 5 43.32	
(*)–37° 2′.		
June 19 . .	15 8 17.40	
23 . .	17.48	
B. A. C. 5026, +38° 45′.		
July 6 . .	15 8 54.43	

1877.		h.	m.	s.	Mag.
(*)+38° 46'.					
July	6	15	10	16.38	
β Libræ, −8° 56'.					
July	4	15	10	23.41	
	7			23.41	
Lacaille 6342, −31° 44'.					
June	23	15	14	33.28	6.5
O. Arg. S. 14487, −29° 57'.					
June	16	15	14	59.79	8.5
O. Arg. S. 14490, −29° 57'.					
June	16	15	15	15.38	9.2
B. A. C. 5064, +50° 41'.					
July	4	15	15	37.38	7.0
	6			37.48	6.5
(*)+41° 36'.					
July	7	15	16	0.31	8.3
Weisse (2) 435, +37° 39'.					
June	23	15	20	42.20	7.7
July	2			42.10	8.5
	6			42.09	8.2
	7			42.08	
Radcliffe 3387, +44° 26'.					
June	16	15	22	11.91	7.5
	19			11.89	7.5
July	4			11.73	6.5
Lacaille 6406, − 32° 12'.					
June	23	15	24	5.08	7.0
(*)−32° 46'.					
July	2	15	25	49.15	
	4			49.35	8.0
Lacaille 6421, − 32° 46'.					
June	19	15	26	27.75	
(*)−23° 47'.					
July	6	15	28	25.30	8.8
α Coronæ Borealis, + 27° 8'.					
June	20	15	29	28.89	
	22			28.78	
(*)−22° 12'.					
July	2	15	29	40.09	
(*)−36° 2'.					
June	16	15	31	56.75	
(*)+38° 26'.					
July	6	15	33	35.72	7.0
(*)−15° 33'.					
June	19	15	33	52.93	
	20			53.17	9.0
(*)+13° 14'.					
July	7	15	33	53.27	8.2
ζ Cor. Borealis (1st *), + 37° 3'.					
July	4	15	34	44.09	
ζ Cor. Borealis (2d *), + 37° 3'.					
July	4	15	34	44.50	
Lalande 28607, — 10° 30'.					
July	6	15	36	28.86	6.5
Lalande 28740, + 66° 12'.					
June	16	15	37	15.25	7.2
	19			15.16	
	23			15.17	7.2
(*)−10° 25'.					
July	6	15	37	16.69	8.5
α Serpentis, + 6° 49'.					
June	22	15	38	12.72	
July	2			12.57	
Lalande 28834+37° 34'.					
July	4	15	42	51.20	7.5
	6			51.36	7.5
Weisse 792, — 14° 47'.					
June	20	15	42	53.39	9.0
	22			53.25	8.8
Weisse 825, — 2° 41'.					
June	19	15	43	58.79	8.2
ε Serpentis, + 4° 51'.					
June	16	15	44	41.11	
July	2			41.11	
	7			41.08	
A Scorpii (2d *), — 24° 57'.					
June	22	15	46	13.57	5.0
	23			13.73	5.0
Lalande 28926, + 37° 55'.					
June	19	15	46	20.60	
	20			20.70	7.0
B. A. C. 5253, — 24° 9'.					
July	4	15	46	33.17	6.0
	6			33.19	5.5
(*)−16° 53'.					
July	2	15	48	27.23	9.0
	7			27.33	9.0
ε Cor. Borealis, +27° 14'.					
June	16	15	52	29.74	
	19			29.71	
	20			29.79	
July	6			29.70	
O. Arg. S. 15101, — 26° 18'.					
July	2	15	53	2.71	8.0
	4			2.89	8.0
49 Libræ, — 16° 10'.					
June	22	15	53	25.39	
	23			25.52	6.0
July	7			25.52	6.0
γ Herculis, + 18° 10'.					
July	2	15	55	42.64	6.0
	4			42.66	6.0
Lalande 29208, — 11° 30'.					
July	6	15	57	38.06	7.7
β^1 Scorpii, — 19° 28'.					
June	22	15	58	17.16	
July	25			17.15	
	26			17.12	
Lacaille 6686, −36° 25'.					
June	16	15	59	11.22	6.5
	19			11.03	6.5
	23			11.12	
(*)−36° 24'.					
June	16	15	59	29.78	7.5
	19			29.88	7.5
	23			29.89	
Lalande 29341, + 34° 30'.					
June	20	15	59	33.63	
July	7			33.41	6.5
B. A. C. 5347, — 26° 0'.					
June	22	16	0	8.01	6.0
(*)−25° 59'.					
July	6	16	0	37.93	
B. A. C. 5357, — 39° 48'.					
July	2	16	1	51.33	6.5
	4			51.40	
(*)−17° 48'.					
June	23	16	3	13.95	7.5
O. Arg. S. 15342, — 17° 48'.					
June	23	16	4	11.05	
48 Serpentis, + 16° 59'.					
June	22	16	5	54.64	
July	2			54.63	6.0
	6			54.59	6.5
	7			54.68	
δ Ophiuchi, — 3° 23'.					
June	19	16	7	54.04	
	20			54.17	
	23			54.10	
July	4			54.05	
Lacaille 6765, — 34° 31'.					
June	22	16	9	26.80	7.0
July	2			26.85	8.0
σ Cor. Borealis (1st *), +34° 10'.					
July	6	16	10	4.11	
	25			4.36	
	26			4.21	
σ Cor. Borealis (2d *), + 34° 10'.					
July	6	16	10	4.26	
	25			4.39	
	26			4.31	
(*)+37° 12'.					
June	20	16	12	8.09	8.3
	22			7.80	8.2
	23			7.86	8.3
(*)+37° 12'.					
June	16	16	13	7.59	8.0
	20			7.70	
19 Scorpii, — 23° 50'.					
July	4	16	13	14.21	5.5
(*)−32° 12'.					
July	7	16	13	33.91	
(*)−32° 11'.					
July	7	16	14	0.73	
ν^1 Cor. Borealis, + 34° 5'.					
July	7	16	17	43.37	
ν^2 Cor. Borealis, + 34° 0'.					
June	16	16	17	51.12	
	20			51.25	6.0
B. A. C. 5471, — 31° 25'.					
June	22	16	17	51.53	7.7
	23			51.30	7.0
O. Arg. S. 15615, — 23° 9'.					
July	2	16	18	1.7	
	4			1.8	
	6			1	
	25				
	26				

(*)−23° 9′.

1877.		h.	m.	s.	Mag.
July	2	16	18	12.38	
	25			12.53	7.0

(*)−23° 7′.

July	25	16	18	12.50	7.0
	26			12.51	7.0

(*)−23° 9′.

July	25	16	18	12.43	7.0
	26			12.44	7.0

ρ¹ OPHIUCHI, − 23° 9′.

July	4	16	18	12.71	
	6			12.56	

ρ² OPHIUCHI, − 23° 9′.

July	2	16	18	12.75	
	4			12.72	
	6			12.62	

(*)−23° 5′.

July	6	16	18	12.56	
	26			12.51	

(*)−33° 15′.

July	2	16	23	28.69	8.5

(*)−33° 11′.

June	16	16	24	10.36	8.2
	22			10.22	7.7
	23			10.28	7.5
July	2			10.24	8.0

WEISSE 439, + 4° 30′.

July	7	16	24	25.53	7.3

LACAILLE 6871, − 33° 14′.

June	16	16	25	2.39	7.0

B. A. C. 5522, − 31° 18′.

July	6	16	25	11.18	7.5
	25			11.00	7.5
	26			11.19	8.0

LACAILLE 6894, − 35° 40′.

July	6	16	28	32.82	6.5

ζ OPHIUCHI, − 10° 19′.

June	20	16	30	23.28	
	22			23.10	
	23			23.14	
July	7			23.26	

O. ARG. S. 15782, − 29° 38′.

July	2	16	30	59.98	7.5
	25			59.90	8.0
	26			59.99	8.5

O. ARG. S. 15788, − 23° 54′.

1877.		h.	m.	s.	Mag.
June	16	16	31	7.57	

(*)−30° 14′.

June	23	16	34	12.68	8.3

B. A. C. 5572, − 30° 14′.

June	23	16	34	16.96	

(*)−39° 16′.

July	7	16	34	37.71	8.0

RADCLIFFE 3588, + 49° 6′.

June	16	16	35	11.16	6.0
	20			11.47	
	22			11.42	

(*)−30° 8′.

July	25	16	35	21.83	

(*)−30° 6′.

July	2	16	35	22.25	
	6			22.03	8.5

42 HERCULIS, +49° 10′.

June	16	16	35	24.66	5.0
	22			24.57	

B. A. C. 5619, +34° 15′.

July	7	16	39	19.40	5.5

LALANDE 30479, −14° 53′.

July	6	16	39	42.28	7.5

B. A. C. 5622, −30° 58′.

June	23	16	40	32.73	7.5
July	2			32.74	6.5

(*)−40° 28′.

June	16	16	43	33.64	

(*)−29° 8′.

July	2	16	43	47.72	
	26			47.80	

B. A. C. 5639, −40° 27′.

June	16	16	43	55.25	

(*)−21° 9′.

July	6	16	44	37.78	9.0
	7			37.66	9.0

(*)−5° 57′.

July	4	16	44	51.05	8.2

(*)−29° 8′.

1877.		h.	m.	s.	Mag.
July	2	16	46	0.30	
	26			0.28	

(*)−29° 9′.

July	2	16	46	23.70	
	26			23.73	

(*)−38° 13′.

July	25	16	46	43.85	7.0

(*)−31° 8′.

June	16	16	47	15.20	7.0

O. ARG. S. 16088, −29° 9′.

July	2	16	47	17.28	
	6			17.06	8.3

O. ARG. S. 16100, −29° 9′.

July	2	16	47	46.58	
	6			46.64	8.0

(*)−30° 1′.

June	20	16	50	17.45	8.0
	23			17.31	8.3
July	25			17.27	8.2

(*)−29° 58′.

July	26	16	50	18.11	

(*)−29° 54′.

June	23	16	50	46.68	8.3

κ OPHIUCHI, +9° 34′.

July	2	16	51	50.84	
	30			50.73	

(*)−36° 59′.

June	23	16	55	10.40	8.3
July	6			10.46	8.5

(*)−36° 59′.

June	23	16	55	20.20	8.3
July	4			20.25	
	6			20.34	8.0

(*)+25° 52′.

June	20	16	55	48.13	8.3

28 OPHIUCHI, −25° 30′.

July	7	16	56	26.71	6.0
	25			26.54	

31 OPHIUCHI, −25° 26′.

July	7	16	57	9.72	6.5
	26			9.60	

WEISSE (2) 1735, +25° 41′.

1877.		h.	m.	s.	M
June	16	16	57	16.19	
	22			16.19	
July	2			16.22	

O. ARG. S. 16298, −25° 15′.

July	26	16	57	49.12	
	30			49.22	

(*)+25° 51′.

June	20	16	57	54.20	

ε URSÆ MINORIS, +82° 14′.

June	22	16	58	37.63	
July	6			38.24	

O. ARG. S. 16366, −27° 14′.

July	2	17	1	25.11	

B. A. C. 5774, −0° 55′.

July	4	17	1	52.96	
	26			52.98	
	30			52.93	

(*)−35° 10′.

July	6	17	5	38.00	

LACAILLE 7171, −39° 37′.

June	22	17	5	56.49	
	23			56.31	
July	2			56.36	

A OPHIUCHI (1st *), −26° 24

July	2	17	7	46.81	

α¹ HERCULIS, +14° 32′.

June	16	17	9	2.42	
	20			2.45	
	23			2.34	
July	25			2.34	
	26			2.37	
Aug.	11			2.35	

B. A. C. 2818, −30° 13′.

July	7	17	9	2.88	
	30			2.38	

(*)−30° 12′.

July	7	17	9	8.39	
	30			7.95	

38 OPHIUCHI (1st *), −26° 2

July	4	17	10	0.64	

(*)−27° 48′.

July	6	17	12	24.76	

(*)−24° 50′.

June	16	17	14	44.68	

7.	h. m. s.	Mag.
(*)+35° 20'.		
25	17 15 32.85	
Lacaille 7259, −34° 41'.		
11	17 15 58.50	6.5
w Herculis, +32° 38'.		
23	17 16 3.42	
(*)−30° 43'.		
30	17 16 22.70	9.5
(*)−35° 16'.		
4	17 16 24.44	9.0
6	24.52	9.0
(*)+35° 20'.		
7	17 16 48.69	8.0
25	48.78	
B. A. C. 5887, +71° 56'.		
2	17 18 8.00	7.0
26	8.12	
10	7.71	
(*)−31° 31'.		
16	17 18 39.43	7.0
(*)+2° 9'.		
22	17 19 43.78	
23	43.65	8.5
(*)+2° 8'.		
22	17 20 0.21	
23	0.17	8.0
Arg. S. 16842, −15° 55'.		
2	17 22 25.04	7.0
(*)−17° 43'.		
7	17 22 30.99	9.0
25	30.93	8.2
Arg. S. 16847, −17° 43'.		
7	17 22 31.10	8.5
25	31.03	8.2
Arg. S. 16854, −17° 43'.		
7	17 22 48.47	7.5
Arg. S. 16856, −15° 55'.		
2	17 22 49.07	8.0
B. A. C. 5916, −29° 34'.		
16	17 25 12.68	
(*)−32° 30'.		
4	17 26 0.23	

1877.	h. m. s.	Mag.
(*)−32° 32'.		
July 4	17 26 1.49	9.0
(*)−32° 32'.		
July 30	17 26 13.56	9.0
B. A. C. 5925, −32° 32'.		
July 30	17 26 40.36	7.0
(*)−38° 32'.		
June 22	17 26 (43.52)	8.3
July 2	42.94	8.5
Aug. 11	42.83	9.0
(*)−38° 31'.		
June 22	17 27 13.36	8.0
O. Arg. S. 16952, −18° 8'.		
July 7	17 27 21.84	7.7
25	21.79	6.5
B. A. C. 5932, −38° 31'.		
July 2	17 28 4.59	5.0
a Ophiuchi, +12° 39'.		
June 16	17 29 13.48	
23	13.50	
July 6	13.51	
(*)−35° 16'.		
July 30	17 29 17.39	8.5
(*)−20° 35'.		
July 7	17 30 11.36	8.0
(*)−32° 6'.		
July 6	17 30 27.68	
(*)−20° 34'.		
July 7	17 30 30.99	9.0
(*)−35° 8'.		
July 2	17 30 56.79	
(*)−35° 8'.		
July 4	17 31 15.14	
(*)−35° 8'.		
July 4	17 31 16.42	
(*)−34° 24'.		
June 22	17 35 36.60	
July 4	36.69	8.5
7	36.62	8.0
58 Ophiuchi, −21° 37'.		
July 2	17 36 3.59	5.0
25	3.46	5.0

1877.	h. m. s.	Mag.
O. Arg. N. 17413, +68° 28'.		
July 26	17 37 8.49	8.5
30	8.13	8.5
O. Arg. N. 17415, +68° 28'.		
July 26	17 37 17.43	8.0
30	17.08	8.0
(*)−7° 48'.		
Aug. 11	17 37 53.84	8.2
17	53.85	8.0
(*)−34° 48'.		
June 22	17 38 16.02	6.5
(*)−34° 48'.		
June 22	17 39 1.43	
(*)−34° 42'.		
July 7	17 39 10.03	7.7
μ Herculis, +24° 47'.		
July 2	17 41 38.76	
4	38.56	
25	38.73	
Aug. 11	38.61	
17	38.64	
29	38.65	
(*)+27° 48'.		
Aug. 27	17 41 42.17	
(*)+36° 10'.		
July 26	17 42 34.51	6.5
Weisse (2) 1394, +36° 11'.		
July 26	17 43 39.49	6.0
30	39.03	7.2
Weisse (2) 1398, +36° 12'.		
July 26	17 43 45.30	7.5
(*)−34° 48'.		
July 7	17 43 52.49	
(*)−34° 48'.		
July 7	17 43 57.21	
B. A. C. 6029, −34° 45'.		
Aug. 10	17 44 1.54	
29	1.27	
(*)−34° 51'.		
July 6	17 44 14.89	
7	15.03	
(*)−34° 42'.		
Aug. 10	17 44 15.29	

1877.	h. m. s.	Mag.
(*)−34° 48'.		
July 7	17 44 28.45	
(*)−34° 52'.		
July 2	17 45 0.79	
(*)−34° 45'.		
Aug. 29	17 45 7.50	
(*)−34° 45'.		
Aug. 27	17 45 10.35	
(*)−34° 51'.		
July 6	17 45 11.00	
7	10.95	
(*)−34° 45'.		
Aug. 29	17 45 17.02	
(*)−34° 48'.		
July 6	17 45 22.36	
7	22.22	
(*)−34° 48'.		
July 6	17 45 31.32	
7	31.55	
Aug. 29	31.59	
(*)−34° 45'.		
July 4	17 45 31.86	
(*)−34° 45'.		
July 4	17 45 32.50	
(*)−34° 45'.		
July 4	17 45 33.23	
25	33.20	
Aug. 29	33.05	
(*)−34° 54'.		
July 2	17 45 34.77	7.5
(*)−34° 45'.		
July 25	17 45 36.80	
(*)−34° 45'.		
Aug. 29	17 45 42.22	
B. A. C. 6043, −34° 44'.		
July 4	17 45 42.73	
Aug. 10	42.85	
(*)−34° 43'.		
July 25	17 45 43.07	

Star	1877.	h.	m.	s.	Mag.
(*)−34° 45′.	July 4	17	45	43.37	
(*)−34° 48′.	July 7	17	45	45.48	
(*)−34° 54′.	July 2	17	45	45.94	8.0
	6			45.62	
(*)−34° 51′.	July 2	17	46	0.76	6.5
	6			0.46	
	7			0.52	
	25			0.73	
	Aug. 29			0.57	
(*)−34° 45′.	July 4	17	46	2.63	
	Aug. 10			2.60	
(*)−34° 53′.	July 2	17	46	9.17	8.0
B. A. C. 6045, −34° 51′.	July 2	17	46	9.46	
	6			9.59	
	7			9.56	
B. A. C. 6046, −34° 26′.	Aug. 17	17	46	16.28	
(*)−34° 51′.	July 6	17	46	24.66	
(*)−34° 22′.	Aug. 17	17	46	36.84	
(*)−34° 45′.	July 4	17	46	41.08	8.5
(*)−36° 58′.	July 26	17	47	34.02	6.5
(*)−34° 52′.	Aug. 27	17	47	47.81	
(*)−34° 52′.	Aug. 27	17	47	54.54	
O. Arg. S. 17349, −26° 55′.	June 22	17	47	56.01	
(*)−34° 22′.	Aug. 17	17	48	29.84	

Star	1877.	h.	m.	s.	Mag.
(*)+38° 12′.	July 30	17	49	15.19	8.3
(*)−28° 4′.	July 6	17	50	18.41	
(*)−28° 4′.	July 6	17	50	22.61	
	Aug. 29			22.26	
(*)−28° 0′.	Aug. 29	17	50	23.32	
(*)+51° 28′.	July 4	17	52	14.68	9.0
	25			15.01	8.5
	26			15.07	8.5
O. Arg. N. 17663, +51° 30′.	July 4	17	52	19.91	8.0
	25			20.19	8.0
	26			20.09	7.8
(*)−24° 9′.	June 22	17	54	0.10	9.0
O. Arg. S. 17489, −24° 10′.	June 22	17	54	18.55	7.5
(*)+36° 18′.	July 7	17	54	24.86	6.0
	30			24.70	6.0
35 Draconis, +76° 58′.	July 2	17	54	57.39	
	26			56.78	
	Aug. 11			57.11	
	27			57.49	
(*)−36° 18′.	July 6	17	55	11.81	8.2
(*)−36° 18′.	July 6	17	55	47.48	8.0
(*)−24° 22′.	July 4	17	56	20.11	
(*)−24° 22′.	July 4	17	56	42.53	
(*)−29° 22′.	July 4	17	56	53.41	
(*)−24° 22′.	July 4	17	57	9.25	

Star	1877.	h.	m.	s.	Mag.
Weisse 1174, +2° 31′.	July 7	17	57	15.66	8.0
(*)−23° 36′.	June 22	17	57	18.88	8.0
ψ² Draconis, +72° 3′.	July 25	17	57	19.38	6.0
	Aug. 29			19.41	
B. A. C. 6111, −24° 22′.	July 4	17	57	37.95	
O. Arg. S. 17648. −21° 12′.	July 6	17	59	58.33	7.5
	26			58.28	7.5
	30			58.44	7.2
(* 33) Washington, −17° 9′.	July 4	18	2	57.63	
	7			57.69	
(*)−17° 9′.	July 4	18	3	8.86	
(*)−17° 12′.	July 7	18	3	9.67	
(*)−28° 16′.	July 26	18	3	12.46	8.2
(*)−28° 16′.	July 30	18	4	18.41	9.0
(*)−20° 24′.	July 25	18	4	30.16	
(*)−20° 21′.	July 25	18	4	37.83	
O. Arg. S. 17797, −28° 16′.	July 30	18	4	45.29	8.5
Lalande 33472, + 36° 29′.	Aug. 11	18	5	42.19	7.5
(*)−37° 40′.	Aug. 17	18	5	45.13	7.0
(*)−37° 41′.	Aug. 17	18	6	3.03	8.2

Star	1877.	h.	m.	s.	Mag.
μ Sagittarii, −21° 5′.	June 22	18	6	25.48	
	July 2			24.40	
	4			24.44	
	6			24.40	
	7			24.47	
	30			24.45	
	Aug. 27			24.37	
(*)−27° 32′.	Aug. 29	18	6	27.14	7.0
(*)−21° 5′.	July 7	18	6	27.78	9.5
	Aug. 27			27.73	
(*)+37° 41′.	July 26	18	7	29.63	7.8
O. Arg. S. 17946, −18° 50′.	Aug. 27	18	8	58.03	8.0
O. Arg. S. 17956, − 18° 50′.	Aug. 27	18	9	23.72	8.0
(*)−17° 24′.	Aug. 29	18	10	2.10	6.5
(*)+85° 40′.	Aug. 17	18	12	46.30	7.5
B. A. C. 6212, − 32° 14′.	July 26	18	13	18.35	6.5
	Aug. 16			18.54	7.0
	27			18.47	
O. Arg. S. 18075 − 17° 48′.	Aug. 29	18	13	30.56	8.0
(*)−29° 31′.	Aug. 16	18	16	34.16	8.2
	27			34.11	8.0
(*)−29° 31′.	Aug. 16	18	16	35.58	8.0
	27			35.63	
(*)−32° 25′.	July 7	18	16	37.65	9.0
(*)−32° 12′.	July 6	18	17	9.39	
(*)−32° 12′.	July 2	18	17	32.51	
	4			32.17	9.0
	6			32.25	
B. A. C. 6261, − 26° 40′.	July 7	18	20	3.60	
	25			3.54	

1877.		h.	m.	s.	Mag.
B. A. C. 6270 (1st *), − 26° 40′.					
July	2	18	21	17.28	
	4			17.31	
	6			17.29	
	25			17.17	
B. A. C. 6270 (2d *), − 26° 40′.					
July	2	18	21	17.75	
	4			17.43	
	6			17.41	
	25			17.18	
LALANDE 34222, — 22° 23′.					
July	25	18	25	5.90	8.3
(*)—36° 47′.					
July	4	18	25	15.60	
	6			15.77	8.5
	7			16.16	8.5
(*)—36° 51′.					
July	4	18	25	19.43	
	6			19.37	8.0
	7			19.61	8.0
1 AQUILÆ, — 8° 20′.					
July	4	18	28	30.87	
	6			30.79	
	25			30.76	
	26			30.83	
	30			30.78	
Aug.	11			30.87	
	17			30.85	
	27			30.82	
	29			30.76	
(* 35) WASHINGTON, + 18° 54′.					
July	7	18	31	29.02	
α LYRÆ, + 38° 40′.					
July	2	18	32	46.39	
Oct.	31			46.44	
LALANDE 34831, + 72° 13′.					
Aug.	17	18	34	37.47	8.3
	27			37.22	8.2
	29			37.39	8.5
B. A. C. 6375 +, 77° 26′.					
July	25	18	35	41.06	6.0
(*)—1° 6′.					
July	7	18	35	47.16	7.5
	30			47.01	7.3
Aug.	11			47.24	7.7
O. ARG. N. 18534, + 72° 19′.					
Aug.	17	18	36	29.06	7.5
	27			28.96	7.5
	29			29.32	7.5
WEISSE 887, — 1° 4′.					
July	7	18	36	52.26	
	30			52.28	8.2
Aug.	11			52.26	

1877.		h.	m.	s.	Mag.
(*)—1° 6′.					
July	7	18	37	0.05	
(*)+72° 19′.					
Aug.	27	18	37	25.02	8.2
	29			25.11	8.2
LALANDE 35006, + 72° 18′.					
Aug.	17	18	38	5.45	
	27			5.25	7.3
	29			5.67	7.8
(*)+36° 28′.					
July	25	18	40	17.35	6.5
LALANDE 34950, + 36° 26′.					
July	7	18	41	3.18	6.0
	25			3.28	7.0
29 SAGITTARII, — 20° 27′.					
Aug.	17	18	42	22.16	
O. ARG. S. 18735, — 22° 15′.					
Aug.	29	18	43	26.83	6.0
LALANDE 34990, — 20° 26′.					
Aug.	17	18	43	42.04	
LALANDE 34393, — 20° 26′.					
Aug.	17	18	43	48.62	
β^1 LYRÆ, + 33° 13′.					
July	7	18	45	32.29	
	26			32.34	
Oct.	31			32.23	
β^2 LYRÆ, + 33° 13′.					
July	7	18	45	34.25	
(*)—33° 25′.					
July	26	18	47	55.09	7.0
Aug.	17			54.93	7.5
(*)—33° 25′.					
July	26	18	48	15.93	7.5
Aug.	17			15.77	8.0
(*)—33° 25′.					
July	25	18	48	22.72	
LACAILLE 7926, — 33° 30′.					
July	26	18	48	52.74	6.5
	30			52.82	
Aug.	17			53.01	
(*)— 33° 29′.					
July	25	18	48	53.34	
	26			53.22	8.3
	30			53.51	8.5
Aug.	17			53.64	

1877.		h.	m.	s.	Mag.
(*)—9° 29′.					
Aug.	11	18	51	44.13	8.2
O. ARG. S. 18913, — 19° 26′.					
Aug.	29	18	52	9.61	6.5
O. ARG. S. 18953, —19° 27′.					
Aug.	29	18	53	50.53	
LACAILLE 7961, — 34° 48′.					
Aug.	17	18	54	24.18	7.5
(*)—15° 2′.					
July	25	18	56	2.50	7.2
	26			2.58	8.0
ζ AQUILÆ, + 13° 41′.					
Aug.	29	18	59	45.41	
Sept.	24			45.33	
	26			45.32	
	29			45.38	
O. ARG. S. 19104, — 21° 58′.					
July	25	19	0	50.10	7.8
	26			50.28	8.0
Aug.	27			50.32	8.0
(*)—1° 30′.					
July	30	19	1	23.18	8.8
LALANDE 35791, — 1° 30′.					
July	30	19	1	34.49	8.0
Aug.	29			34.45	8.0
O. ARG. S. 19140, — 15° 29′.					
Aug.	17	19	2	0 28	8.2
LALANDE 36002, + 38° 19′.					
July	25	19	4	25.00	7.0
21 AQUILÆ, + 2° 4′.					
Aug.	27	19	7	30.54	5.5
(*)—22° 15′.					
Aug.	17	19	8	35.12	9.0
O. ARG. S. 19366, — 22° 0′.					
Aug.	29	19	8	35.49	8.0
(*)—19° 18′.					
July	25	19	9	44.58	9.0
	26			44.81	8.8
(*)—19° 18′.					
Sept.	29	19	10	8.97	
(*)—19° 18′.					
July	30	19	10	18.68	8.0
Sept.	29			18.77	8.0

1877.		h.	m.	s.	Mag.
(*)+46° 46′.					
Aug.	27	19	12	30.26	8.2
(*)—19° 13′.					
Aug.	17	19	13	17.36	
GR. C. 1710, +44° 46′.					
Aug.	11	19	13	19.74	
	27			19.75	
	29			19.87	6.5
Sept.	26			19.65	6.5
	29			19.72	
(*)—8° 25′.					
July	25	19	17	4.11	9.0
	26			4.05	8.5
(*)—8° 25′.					
July	25	19	17	11.08	8.0
	26			11.15	
(*)+36° 54′.					
Sept.	26	19	17	43.35	8.5
(*)+36° 54′.					
Sept.	26	19	18	17.68	8.0
(*)+36° 54′.					
Sept.	24	19	19	11.21	
δ AQUILÆ, +2° 52′.					
July	25	19	19	17.70	
Sept.	18			17.74	
Oct.	6			17.66	
	9			17.73	
WEISSE (2) 556, +36° 54′.					
Aug.	17	19	19	18.47	8.2
	27			18.67	8.3
Sept.	29			18.54	
(*)+36° 54′.					
Sept.	26	19	19	36.77	
π DRACONIS, +65° 27′.					
July	26	19	20	2.08	
	30			1.57	5.0
Aug.	11			1.91	5.5
LALANDE 36732, +36° 54′.					
Aug.	17	19	20	8.71	7.5
	27			8.90	7.5
(*)+36° 54′.					
Sept.	24	19	20	15.	
	29			14.	

(*)+36° 58′.

1877.		h. m.	s.	Mag.
Aug. 17	. .	19 20	25.04	7.5
(*)+36° 54′.				
Sept. 24	. .	19 20	46.36	
29	. .		46.23	
(*)+36° 58′.				
Aug. 27	. .	19 20	56.50	7.0
(*)+36° 47′.				
Aug. 29	. .	19 21	18.37	8.2
(*)+76° 14′.				
July 26	. .	19 23	32.68	8.0
30	. .		31.42	
Aug. 11	. .		31.67	
(*)+38° 55′.				
Aug. 17	. .	19 25	32.86	
Sept. 26	. .		32.27	
B. A. C. 6702, +76° 18′.				
July 26	. .	19 25	54.48	
30	. .		53.61	
Aug. 11	. .		54.01	
Lacaille 8158, −41° 43′.				
Aug. 27	. .	19 29	3.87	8.0
(*)−41° 43′.				
Aug. 17	. .	19 29	7.00	7.5
27	. .		7.00	7.5
Sept. 24	. .		7.10	
Weisse 722, −10° 26′.				
Sept. 26	. .	19 30	5.18	6.5
κ Aquilæ, −7° 18′.				
July 26	. .	19 30	16.41	
30	. .		16.36	
Oct. 12	. .		16.43	
(*)+38° 56′.				
Oct. 6	. .	19 30	21.67	8.4
9	. .		21.74	
(*)+38° 58′.				
Oct. 6	. .	19 30	24.13	8.2
9	. .		24.22	
(*)−10° 12′.				
Sept. 29	. .	19 30	57.85	7.0
(*)+38° 58′.				
Oct. 6	. .	19 31	54.87	8.0

(*)−10° 26′.

1877.		h. m.	s.	Mag.
Sept. 24	. .	19 31	57.85	6.0
26	. .		57.95	6.5
(*)+38° 30′.				
Aug. 29	. .	19 33	46.95	8.0
Oct. 9	. .		47.02	8.2
(*)+38° 32′.				
Aug. 29	. .	19 34	46.26	9.5
14 Cygni, +42° 31′.				
Aug. 17	. .	19 35	26.32	5.5
B. A. C. 6752, +71° 19′.				
July 26	. .	19 35	38.84	6.0
30	. .		37.87	
Aug. 11	. .		38.64	
O. Arg. S. 19933, −27° 33′.				
Sept. 29	. .	19 38	44.06	7.2
O. Arg. S. 19941, −26° 37′.				
Sept. 26	. .	19 39	27.88	
γ Aquilæ, +10° 19′.				
Oct. 6	. .	19 40	24.73	
9	. .		24.82	
12	. .		24.69	
31	. .		24.75	
B. A. C. 6775, −29° 12′.				
July 26	. .	19 40	59.59	8.5
Aug. 17	. .		59.75	
27	. .		59.72	
29	. .		59.66	
Sept. 24	. .		59.75	
(*)+34° 59′.				
Aug. 29	. .	19 43	21.51	
(*)+34° 57′.				
Sept. 18	. .	19 43	27.49	8.3
26	. .		27.89	
29	. .		27.73	8.0
(*)+69° 2′.				
July 26	. .	19 43	29.47	6.0
Lalande 37785, +34° 59′.				
Sept. 1	. .	19 44	8.44	7.5
18	. .		8.25	7.0
24	. .		8.43	
26	. .		8.43	
29	. .		8.48	6.5
Oct. 12	. .		8.27	7.0

B. A. C. 6808, +69° 2′.

1877.		h. m.	s.	Mag.
July 26	. .	19 44	28.65	
Aug. 11	. .		28.45	6.5
Oct. 6	. .		28.58	
α Aquilæ, +8° 33′.				
Aug. 27	. .	19 44	46.91	
ε Draconis, +69° 58′.				
July 26	. .	19 48	34.96	4.5
Aug. 11	. .		34.69	
Oct. 6	. .		34.90	
(*)−38° 3′.				
Oct. 9	. .	19 49	9.76	7.0
(*)−38° 3′.				
Oct. 12	. .	19 49	26.17	7.0
(*)−37° 59′.				
Aug. 29	. .	19 49	38.51	
Oct. 9	. .		38.65	7.5
Weisse 1259. −14° 20′.				
Oct. 6	. .	19 51	31.12	
O. Arg. S. 20124, −25° 26′.				
Sept. 18	. .	19 51	36.89	
26	. .		36.55	
(*)+40° 2′.				
Aug. 27	. .	19 52	53.78	8.3
29	. .		53.57	9.0
Sept. 24	. .		53.61	8.5
B. A. C. 6857, +40° 2′.				
Aug. 27	. .	19 52	57.52	
29	. .		57.60	
Sept. 24	. .		57.44	6.0
Lalande 38202 (1st *), +37° 47′.				
Oct. 9	. .	19 54	8.27	
Lalande 38202 (2d *), +37° 47′.				
Oct. 9	. .	19 54	8.56	
Lalande 38164, −19° 25′.				
Sept. 29	. .	19 54	52.94	7.5
(*)+34° 58′.				
Oct. 22	. .	19 55	2.72	
(*)+34° 59′.				
Aug. 17	. .	19 55	12.07	
Oct. 12	. .		11.72	8.0

(*)+34° 57′.

1877.		h. m.	s.	Mag.
Aug. 17	. .	19 55	18.87	
Oct. 12	. .		18.58	8.0
(*)+35° 0′.				
July 26	. .	19 55	41.86	7.5
Aug. 17	. .		41.82	
Oct. 12	. .		41.74	7.0
22	. .		41.81	
τ Aquilæ, +6° 56′.				
July 26	. .	19 58	7.77	
Aug. 10	. .		7.83	
11	. .		7.91	
17	. .		7.82	
Sept. 18	. .		7.83	
Oct. 22	. .		7.87	
24	. .		7.77	
(*)+30° 54′.				
Oct. 9	. .	19 59	19.99	6.5
12	. .		19.79	7.0
(*)+33° 7′.				
Sept. 29	. .	20 1	46.48	7.8
(*)+33° 7′.				
Aug. 17	. .	20 2	0.29	8.0
27	. .		0.52	6.5
Sept. 24	. .		0.47	8.0
29	. .		0.36	
(*)−9° 15′.				
Oct. 12	. .	20 2	49.71	
(*)−9° 15′.				
Aug. 10	. .	20 3	49.82	
Oct. 9	. .		49.77	9.0
(*)−14° 3′.				
Oct. 12	. .	20 5	16.08	
(*)−14° 3′.				
Oct. 9	. .	20 5	20.25	9.0
ξ^{2} Capricorni, −12° 58′.				
Oct. 24	. .	20 5	34.65	6.0
31	. .		34.70	5.0
Weisse XX, 81, −14° 9′.				
Aug. 27	. .	20 5	54.78	7.5
Sept. 29	. .		54.69	8.0
(*)−9° 12′.				
Aug. 10	. .	20 6	22.90	
(*)−9° 12′.				
Aug. 17	. .	20 6	23.94	

1877.	h.	m.	s.	Mag.
(*)−9° 12'.				
Aug. 10	20	6	24.99	
(*)+38° 19'.				
Oct. 24	20	7	18.58	8.0
(*)+38° 19'.				
Oct. 24	20	7	24.61	8.0
Weisse (2) 306, +38° 21'.				
Sept. 24	20	8	55.54	8.0
(*)+38° 21'.				
Aug. 27	20	9	8.23	
Sept. 24			8.41	8.2
o^2 Cygni, +46° 20.				
Oct. 22	20	9	45.51	5.5
(*)+46° 20'.				
Oct. 22	20	9	46.74	8.0
31			46.84	
b^3 Cygni, +36° 24'.				
Aug. 17	20	9	55.30	5.0
B. A. C. 6969, +36° 21'.				
Aug. 10	20	10	3.60	
17			3.64	6.0
(*)+36° 44'.				
Sept. 26	20	11	12.04	
29			11.81	
α^2 Capricorni, −12° 55'.				
Aug. 11	20	11	13.73	
29			13.70	
Sept. 24			13.69	
Oct. 6			13.75	
O. Arg. S. 20388, −18° 13'.				
Oct. 9	20	11	41.41	7.5
(*)+36° 44'.				
Sept. 26	20	11	47.81	
29			47.81	
(*)+36° 44'.				
Sept. 29	20	12	6.75	
(*)+36° 46'.				
Sept. 26	20	12	13.06	
29			13.16	
34 Cygni, +37° 39'.				
Oct. 12	20	13	14.85	5.0
24			15.11	5.5

1877.	h.	m.	s.	Mag.
(*)+36° 44'.				
Sept. 29	20	13	26.68	
(*)+36° 44'.				
Aug. 10	20	15	5.77	8.5
(*)+36° 44'.				
Sept. 29	20	15	9.99	
B. A. C. 7006, +36° 44'.				
Aug. 10	20	15	11.91	7.5
O. Arg. S. 20439, −29° 31'.				
Oct. 9	20	15	22.44	7.8
(*)−13° 37'.				
Aug. 17	20	15	50.04	8.5
27			50.06	
Weisse 359, −13° 36'.				
Aug. 17	20	16	12.87	8.8
(*)+36° 44'.				
Aug. 10	20	16	53.94	8.0
Sept. 24			53.92	8.0
26			53.82	
25 Vulpeculæ, +24° 4'.				
Oct. 6	20	16	46.11	6.0
Lalande 39208, −0° 48'.				
Oct. 31	20	16	59.64	7.0
B. A. C. 7014, +4° 57'.				
Oct. 22	20	17	5.04	
71 Draconis, +61° 52'.				
Oct. 12	20	17	33.26	
π Capricorni, −18° 36'.				
Aug. 10	20	20	16.71	
17			16.80	
27			16.71	
29			16.70	
Sept. 24			16.72	
26			16.72	
Oct. 9			16.60	5.5
24			16.81	
B. A. C. 7036, −35° 58'.				
Oct. 6	20	20	52.65	6.0
B. A. C. 7039, −24° 32'.				
Oct. 31	20	21	10.78	6.5
O. Arg. S. 20533, −21° 17'.				
Oct. 22	20	21	51.14	7.0

1877.	h.	m.	s.	Mag.
B. A. C. 7053, −19° 0'.				
Sept. 29	20	22	49.27	6.5
o Capricorni, −19° 0'.				
Sept. 29	20	22	50.61	6.0
Lalande 39496, +38° 54'.				
Oct. 12	20	23	55.02	7.0
(*)+38° 57'.				
Oct. 12	20	23	56.69	8.2
Lacaille 8475 (2d *), −40° 57'.				
Oct. 9	20	25	35.88	
B. A. C. 7080, −10° 17'.				
Aug. 17	20	25	39.94	6.0
Sept. 26			39.92	6.0
Oct. 6			39.84	
24			39.95	
Weisse 610, −8° 35'.				
Oct. 31	20	25	48.67	7.5
O. Arg. S. 20607, −23° 39'.				
Oct. 22	20	26	53.00	8.0
ε Delphini, +10° 53'.				
Aug. 10	20	27	20.20	
Sept. 18			20.19	
η Delphini, +12° 35'.				
Sept. 29	20	28	7.89	5.5
(*)+37° 27'.				
Oct. 12	20	29	44.29	7.0
B. A. C. 7112, +46° 16'.				
Oct. 6	20	29	53.41	
31			53.39	5.8
B. A. C. 7114, +40° 40'.				
Sept. 26	20	30	9.67	6.0
(*)−19° 12'.				
Oct. 22	20	31	9.51	8.3
27 Vulpeculæ, +26° 2'.				
Oct. 9	20	31	50.00	
(*)+27° 21'.				
Oct. 24	20	32	21.01	8.0
(*)+37° 52'.				
Oct. 12	20	32	38.80	

1877.	h.	m.	s.	Mag.
(*)+37° 49'.				
Aug. 11	20	32	43.89	8.3
17			44.02	8.5
1 Aquarii, +0° 4'.				
Sept. 29	20	33	6.53	6.0
Oct. 6			6.51	5.5
(*)−9° 5'.				
Sept. 26	20	34	6.83	7.5
B. A. C. 7148, −28° 25'.				
Oct. 22	20	34	6.91	7.0
(*)+34° 58'.				
Aug. 17	20	36	49.05	
(*)+34° 58'.				
Aug. 17	20	37	11.61	
Weisse 924, +0° 3'.				
Sept. 29	20	37	15.04	8.2
(*)+34° 56'.				
Oct. 6	20	37	21.09	
9			21.41	8.5
Lalande 40043, +34° 58'.				
Oct. 6	20	37	33.21	
9			33.34	7.0
O. Arg, S. 20802, −24° 12'.				
Oct. 12	20	37	49.01	8.0
O. Arg. S. 20805, −24° 20'.				
Sept. 26	20	38	4.69	8.0
O. Arg. S. 20812, −21° 19'.				
Oct. 22	20	38	37.30	9.3
(*)−24° 8'.				
Oct. 24	20	38	58.96	
O. Arg. S. 20817, −24° 12'.				
Oct. 24	20	38	59.22	
(*)−24° 8'.				
Oct. 24	20	39	3.14	
B. A. C. 7195, −23° 18'.				
Sept. 26	20	41	5.94	
(*)−13° 58'.				
Aug. 11	20	41	30.31	
17			30.14	8.5

1877.		h.	m.	s.	Mag.
4 Cephei, +66° 13'.					
Oct.	6	20	41	38.57	
	9			38.85	5.5
	31			38.75	6.0
Weisse 1057, +3° 12'.					
Sept.	29	20	42	13.89	
(*)+38° 52'.					
Sept.	26	20	43	21.53	
O. Arg. S. 20896, −27° 36'.					
Aug.	17	20	54	2.77	9.0
Oct.	12			2.67	9.0
	22			2.95	
(*)−27° 45'.					
Aug.	17	20	44	12.36	6.0
Sept.	24			11.97	7.5
(*)+38° 50'.					
Oct.	6	20	44	30.88	8.0
	24			30.77	8.0
μ Aquarii, −9° 26'.					
Sept.	29	20	46	1.06	
Nov.	17			1.05	
	19			1.08	
(*)+37° 56'.					
Oct.	31	20	46	39.63	8.5
31 Vulpeculæ, +26° 37'.					
Aug.	11	20	46	51.66	5.5
(*)+37° 58'.					
Oct.	31	20	47	18.88	7.0
(*)+37° 56'.					
Oct.	31	20	47	21.19	8.5
(*)+37° 56'.					
Oct.	24	20	47	22.89	7.5
(*)−19° 30'.					
Sept.	24	20	48	43.02	9.0
Oct.	6			43.11	
	9			42.90	8.8
57 Cygni, +43° 54'.					
Oct.	12	20	48	53.62	5.5
(*)−19° 30'.					
Oct.	6	20	49	5.13	
	9			5.18	8.2
B. A. C. 7255 (1st *), +4° 3'.					
Sept.	26	20	49	31.01	

1877.		h.	m.	s.	Mag.
B. A. C. 7255 (2d *), +4° 3'.					
Sept.	26	20	49	31.14	
	29			31.09	
B. A. C. 7259, +43° 55'.					
Oct.	12	20	49	32.06	7.2
	22			32.41	7.0
17 Delphini, +13° 16'.					
Aug.	11	20	49	47.27	6.0
	17			47.33	5.5
76 Draconis, +82° 4'.					
Sept.	18	20	51	22.80	
B. A. C. 7269, +3° 42'.					
Sept.	24	20	51	39.00	6.5
18 Delphini, +10° 24'.					
Nov.	17	20	52	30.46	
(*)−19° 37'.					
Oct.	24	20	52	40.64	9.0
(*)−14° 0'.					
Oct.	12	20	53	27.58	7.2
	31			27.54	7.5
Radcliffe 5050, +43° 56'.					
Oct.	9	20	54	20.36	
Weisse 1359, −14° 0'.					
Oct.	31	20	54	21.51	7.0
Weisse 1394, −12° 59'.					
Aug.	17	20	55	41.42	6.0
Sept.	26			41.40	6.5
(*)−12° 57'.					
Aug.	17	20	55	48.99	8.3
(*)+37° 10'.					
Sept.	29	20	56	4.60	7.7
12 Aquarii (1st *), −6° 16'.					
Nov.	17	20	57	34.22	
12 Aquarii (2d *), −6° 17'.					
Oct.	24	20	57	34.28	
Nov.	17			34.24	
(*)−32° 50'.					
Sept.	24	20	57	39.45	7.3
O. Arg. S. 21083, −16° 5'.					
Oct.	22	20	57	40.65	8.2

1877.		h.	m.	s.	Mag.
B. A. C. 7320, +38° 10'.					
Oct.	12	20	58	18.44	6.5
O. Arg. S. 211115, −16° 5'.					
Aug.	17	20	59	57.87	8.0
(*)−16° 4'.					
Oct.	9	21	1	7.63	7.2
Lacaille 8701, −29° 0'.					
Sept.	24	21	1	37.75	
Lacaille 8699, −37° 10'.					
Sept.	29	21	1	38.48	6.0
f² Cygni, +47° 10'.					
Oct.	6	21	2	22.05	
Lacaille 8706, −33° 20'.					
Oct.	12	21	2	49.09	7.0
Lalande 41086, +38° 12'.					
Sept.	18	21	4	19.79	
	24			19.90	7.0
	26			20.05	
Oct.	22			19.96	
(*)+38° 15'.					
Sept.	26	21	4	21.41	8.5
Lacaille 8719, −39° 53'.					
Nov.	17	21	5	10.45	5.0
Lacaille 8737, −41° 2'.					
Aug.	17	21	7	19.92	
Sept.	29			19.79	7.0
Oct.	9			20.12	
ζ Cygni, +29° 44'.					
Oct.	12	21	7	42.05	
	31			42.15	
Weisse (2) 154, +35° 18'.					
Oct.	24	21	7	54.72	7.0
29 Capricorni, −15° 42'.					
Aug.	11	21	8	56.25	5.5
B. A. C. 7378, −20° 42'.					
Sept.	24	21	9	41.26	7.0
	26			41.34	6.0
Lacaille 8760, −39° 21'.					
Oct.	22	21	10	2.72	6.0
Nov.	17			2.75	6.0
	19			2.91	

1877.		h.	m.	s.	Mag.
Weisse 239, −13° 34'.					
Oct.	9	21	12	36.71	6.5
	12			36.67	
Lalande 41419, +38° 41'.					
Oct.	24	21	12	45.49	
	31			45.59	7.0
Weisse 258, −13° 30'.					
Oct.	9	21	13	18.57	8.2
(*)+48° 48'.					
Oct.	6	21	15	22.00	7.0
(*)+48° 50'.					
Oct.	22	21	16	4.27	7.5
1 Pegasi, +19° 17'.					
Aug.	11	21	16	23.89	
	17			23.87	
(*)+48° 48'.					
Oct.	22	21	16	27.72	8.5
Weisse 357, −11° 14'.					
Sept.	24	21	17	6.02	
Oct.	24			6.12	9.0
Nov.	17			5.99	8.5
Weisse 364, −11° 8'.					
Nov.	17	21	17	35.57	
Lalande 41624, +38° 6'.					
Aug.	17	21	17	52.38	
Oct.	6			52.54	7.5
	12			52.03	
(*)+38° 6'.					
Oct.	6	21	17	59.76	
(*)+23° 48'.					
Oct.	31	21	18	44.02	9.0
(*)+38° 3'.					
Aug.	17	21	18	55.22	
Oct.	12			54.80	
(*)+38° 6'.					
Oct.	12	21	19	37.36	
(*)+36° 9'.					
Oct.	24	21	20	14.50	8.2
Nov.	17			14.47	8.2
69 Cygni, +36° 7'.					
Oct.	24	21	20	45.55	6.5

1877.		h.	m.	s.	Mag.
(*)+69° 56′.					
Sept.	24	21	21	36.92	9.0
(*)−23° 46′.					
Aug.	17	21	22	51.24	
Oct.	6			51.31	9.0
	12			51.14	9.0
B. A. C. 7466, −25° 44′.					
Aug.	11	21	23	19.47	
O. Arg. N. 22321, +69° 56′.					
Oct.	22	21	23	44.69	7.0
	31			44.50	7.2
β Aquarii, −6° 7′.					
Sept.	26	21	25	4.96	
	29			4.97	
Nov.	16			4.93	
	17			4.99	
(*)+69° 56′.					
Sept.	24	21	25	31.84	8.5
(*)−25° 45′.					
Aug.	17	21	26	37.91	
Oct.	6			37.95	8.8
(*)−25° 45′.					
Oct.	12	21	26	39.06	8.5
(*)+38° 0′.					
Oct.	22	21	28	35.63	
Lalande 42034, +37° 59′.					
Oct.	9	21	28	35.69	7.5
	22			35.63	7.5
(*)+38° 0′.					
Oct.	24	21	28	44.02	8.5
(*)+38° 0′.					
Oct.	9	21	28	47.42	8.7
ρ Cygni, +45° 3′.					
Oct.	31	21	29	21.54	5.0
Nov.	17			21.23	
ξ Aquarii, −8° 24′.					
Sept.	26	21	31	12.20	
	29			12.07	
5 Pegasi, +18° 45′.					
Aug.	17	21	32	0.20	5.0
Sept.	18		31	59.98	
Oct.	6		32	0.14	
α Aquarii, +1° 41′.					
Oct.	12	21	33	18 82	
	22			18.84	6.0
κ Capricorni, −19° 26′.					
Aug.	17	21	35	47.29	
Sept.	18			47.08	
Oct.	6			47.22	

1877.		h.	m.	s.	Mag.
Weisse (2) 871, +34° 6′.					
Sept.	24	21	35	50.93	
	26			50.96	6.5
Nov.	16			50.97	7.0
(*)+34° 8′.					
Sept.	24	21	36	8.55	
	26			8.62	8.2
(*)+36° 59′.					
Oct.	22	21	37	1.44	8.0
	24			1.38	7.7
	31			1.61	7.3
ε Pegasi, +9° 19′.					
Aug.	17	21	38	8.77	
Weisse 916, −0° 45′.					
Nov.	16	21	39	3.63	
11 Cephei, +70° 45′.					
Sept.	18	21	40	6.49	
B. A. C. 7584, +24° 58′.					
Sept.	26	21	40	21.83	5.5
B. A. C. 7586, +24° 57′.					
Sept.	26	21	40	48.03	6.5
B. A. C. 7590, +16° 38′.					
Oct.	22	21	41	13.88	6.0
	24			13.82	6.5
(*)−24° 13′.					
Oct.	12	21	41	56.20	8.2
	31			56.21	8.2
Nov.	17			56.10	8.5
Lalande 42563, +38° 5′.					
Nov.	16	21	43	22.94	6.5
(*)+38° 57′.					
Sept.	26	21	45	21.55	7.5
Oct.	6			21.64	7.5
B. A. C. 7614, +38° 58′.					
Nov.	16	21	45	59.49	6.0
O. Arg. S. 21710, −19° 43′.					
Oct.	22	21	46	12.38	8.0
(*)−5° 57′.					
Oct.	12	21	46	12.79	8.2
B. A. C. 7616, −4° 33′.					
Oct.	31	21	46	20.19	6.5
Nov.	17			20.12	6.8

1877.		h.	m.	s.	Mag.
μ Capricorni, −14° 8′.					
Sept.	18	21	46	35.33	
	24			35.35	
Oct.	9			35.31	
	24			35.39	
Nov.	19			35.32	
(*)−20° 37′.					
Nov.	19	21	49	42.65	
Weisse (2) 1196+35° 34′.					
Sept.	24	21	50	6.13	6.5
	26			6.10	6 0
(*)−20° 37′.					
Oct.	24	21	50	50.43	7.7
(*)+8° 49′.					
Nov.	17	21	52	19.46	6.5
(*)+48° 4′.					
Nov.	16	21	52	20.44	6.5
Lacaille 8981, −29° 38′.					
Oct.	6	21	52	25.40	7.5
	9			25.38	7.4
(*)−20° 37′.					
Oct.	22	21	52	29.39	8.2
Nov.	19			29.28	
(*)−21° 35′.					
Oct.	12	21	52	58.90	
O. Arg. S. 21789, −21° 15′.					
Oct.	31	21	52	59.10	9.5
η Piscis Australis, −29° 2′.					
Sept.	24	21	53	45.99	5.5
	26			45.85	5.5
29 Aquarii (1st *), +17° 33′.					
Oct.	6	21	55	42.58	
29 Aquarii (2d *), +17° 33′.					
Oct.	6	21	55	42.70	
30 Aquarii, −7° 7′.					
Oct.	12	21	56	48.29	5.5
	31			48.13	5.5
Weisse (2) 1398, +36° 24′.					
Oct.	22	21	56	59.55	
Lacaille 9012, −29° 0′.					
Nov.	17	21	57	36.59	7.0

1877.		h.	m.	s.	Mag.
α Aquarii, −0° 55′.					
Sept.	29	21	59	27.97	
Oct.	22			27.90	
ξ Cephei (1st *), +64° 1′.					
Sept.	24	22	0	13.00	7.0
	26			13.09	
Oct.	12			13.09	7.5
	24			12.77	
ξ Cephei (2d *), +64° 1′.					
Sept.	24	22	0	13.80	6.0
	26			14.07	
Oct.	12			14.00	
	24			13.58	
B. A. C. 7702, −34° 36′.					
Nov.	17	22	1	13.78	5.5
O. Arg. N. 23385, +53° 1′.					
Oct.	6	22	1	27.89	7.0
	9			27.83	7.5
O. Arg. N. 23425, +53° 8′.					
Oct.	31	22	2	2.31	9.0
Nov.	16			1.98	8.5
(*)+53° 8′.					
Oct.	31	22	2	26.07	9.0
Nov.	16			26.22	8.8
(*)+71° 44′.					
Sept.	29	22	4	53.23	6.5
Oct.	6			53.39	7.0
	9			53.41	7.0
(*)−12° 12′.					
Oct.	22	22	5	38.36	
B. A. C. 7744, −5° 20′.					
Oct.	24	22	6	19.54	6.0
Nov.	17			19.52	
(*)+16° 34′.					
Oct.	12	22	6	41.79	8.3
Piazzi 33, +16° 34′.					
Sept.	24	22	8	23.91	6.0
	26			23.86	6.0
Oct.	12			23.90	
θ Aquarii, −8° 24′.					
Oct.	9	22	10	20.59	
	12			20.46	
Nov.	16			20.53	
	17			20.56	
(*)+37° 42′.					
Oct.	22	22	11	3.05	9.0
	31			3.07	9.0
45 Aquarii, −13° 55′.					
Sept.	29	22	12	24.59	6.0
Weisse 223, −8° 25.′					
Oct.	24	22	12	40.50	8.3
47 Aquarii. −22° 12′.					
Nov.	16			4	

(*)−35° 7′.

1877.		h.	m.	s.	Mag.
Sept.	24	22	14	50.24	
(*)−35° 7′.					
Sept.	24	22	14	57.42	
	26			57.43	
31 Pegasi, +11° 36′.					
Oct.	31	22	15	27.93	
2 Lacertæ, +45° 55′.					
Nov.	17	22	15	56.74	
(*)+36° 37′.					
Sept.	29	22	16	28.73	8.0
49 Aquarii, −25° 24′.					
Oct.	12	22	16	39.41	
Weisse (2) 349, +36° 34′.					
Nov.	19	22	16	42.97	
(*)+36° 36′.					
Oct.	22	22	16	42.35	
	24			42.23	9.0
(*)+36° 37′.					
Oct.	9	22	17	28.63	
(*)+36° 41.′					
Sept.	24	22	17	32.35	
	29			32.23	8.0
Oct.	9			32.41	
π Aquarii, +0° 45′.					
Oct.	31	22	18	59.65	
(*)+38° 33′.					
Nov.	17	22	20	14.75	8.6
	19			15.07	
(*)+38° 33′.					
Nov.	17	22	20	24.06	8.6
	19			23.74	
O. Arg. S. 22165, −27° 50′.					
Oct.	12	22	21	18.36	8.0
Lalande 43871, +39° 1′.					
Sept.	26	22	21	41.90	7.3
37 Pegasi, +3° 48′.					
Sept.	29	22	23	44.82	6.0
(*)+6° 35′.					
Oct.	9	22	24	42.88	9.2
α Lacertæ, +49° 39′.					
Sept.	26	22	26	13.80	
Oct.	12			13.66	

(*)+6° 43′.

1877.		h.	m.	s.	Mag.
Oct.	22	22	26	23.65	
	24			23.90	
	31			24.22	
(*)+6° 43′.					
Oct.	31	22	26	24.26	
(*)+6° 43′.					
Oct.	22	22	26	24.32	
	24			24.36	
	31			24.32	
(*)+39° 9′.					
Nov.	17	22	26	41.54	8.2
B. A. C. 7858, +39° 9′.					
Nov.	17	22	27	0.19	6.0
η Aquarii, −0° 45′.					
Sept.	24	22	29	2.12	
Oct.	6			2.10	
	31			2.10	
Nov.	19			2.08	
Dec.	14			2.11	
	15			2.09	
O. Arg. S. 22282, −22° 26′.					
Oct.	9	22	30	52.76	8.0
	22			52.77	8.2
Lacaille 9196, −39° 7′.					
Sept.	24	22	31	49.97	
	26			50.07	
9 Lacertæ, +50° 55′.					
Sept.	29	22	32	19.55	
Oct.	12			19.52	
Nov.	17			19.41	5.0
ζ Pegasi, +10° 12′.					
Oct.	22	22	35	19.70	
Nov.	16			19.70	
Dec.	14			19.63	
	15			19.62	
19 Piscis Australis, −30° 0′.					
Nov.	17	22	35	31.30	
ο Pegasi, +28° 40′.					
Sept.	29	22	35	59.14	
Oct.	6			59.03	
(*)−14° 16′.					
Sept.	24	22	38	19.78	8.0
Oct.	9			19.96	
	31			19.99	
(*)−14° 18′.					
Sept.	24	22	38	26.62	
Oct.	6			26.65	8.2
	9			26.62	
	31			26.62	
(*)−14° 18′.					
Sept.	24	22	38	27.60	
Oct.	31			27.45	

B. A. C. 7941, +80° 45′.

1877.		h.	m.	s.	Mag.
Sept.	26	22	39	7.08	
Oct.	22			6.72	
(*)+50° 52′.					
Nov.	17	22	39	8.16	
(*)+50° 47′.					
Oct.	24	22	40	11.66	8.0
(*)+50° 47′.					
Nov.	17	22	40	23.70	
Lacaille 9256, −26° 33′.					
Dec.	15	22	41	10.82	
(*)−33° 30′.					
Oct.	12	22	43	7.68	8.0
(*)+65° 23′.					
Nov.	17	22	44	1.13	8.5
B. A. C. 7957, −39° 49′.					
Oct.	9	22	44	1.77	5.0
Weisse (2) 1012, +39° 1′.					
Oct.	6	22	44	25.73	8.0
Lacaille 9284, −39° 37′.					
Oct.	9	22	45	9.50	7.2
Weisse 976, −10° 57′.					
Oct.	12	22	48	2.68	7.5
Lalande 44848, +35° 19′.					
Nov.	19	22	48	59.11	
Lacaille 9301, −32° 17′.					
Dec.	15	22	49	3.62	
(*)+35° 19′.					
Nov.	19	22	49	15.49	
(*)+35° 18′.					
Nov.	19	22	49	18.65	
(*)+35° 36′.					
Oct.	24	22	49	42.66	7.5
(*)−26° 50′.					
Oct.	12	22	50	29.49	
Lacaille 9315 (1st *), −26° 50′.					
Oct.	9	22	51	5.32	
Nov.	17			5.35	9.5
Lacaille 9315 (2d *), −26° 45′.					
Oct.	6	22	51	5.44	
	9			5.46	
Nov.	17			5.53	7.7

O. Arg. S. 22516, −26° 50′.

1877.		h.	m.	s.	Mag.
Sept.	26	22	51	7.07	8.3
Oct.	6			6.96	
	9			7.09	
Lalande 44918, +38° 44′.					
Oct.	22	22	51	55.83	6.5
Dec.	14			55.57	7.0
	15			55.77	
Lalande 44922, +38° 40′.					
Oct.	22	22	51	59.85	5.5
Dec.	14			59.76	
	15			59.94	
B. A. C. 8010, −9° 32′.					
Oct.	24	22	53	54.48	6.5
(*)−6° 37′.					
Oct.	6	22	55	31.21	7.0
Nov.	17			31.31	7.5
Weisse 1149, −12° 0′.					
Oct.	12	22	55	56.27	
Weisse 1156, −11° 57′.					
Oct.	12	22	56	5.32	
Weisse 1204, −12° 50′.					
Oct.	22	22	58	2.91	7.5
α Pegasi, +14° 33′.					
Sept.	4	22	58	38.08	
	24			38.04	
	26			38.14	
Oct.	6			38.11	
Nov.	16			38.04	
Lacaille 9373, −30° 42′.					
Dec.	14	23	0	15.97	
	15			15.84	5.5
56 Pegasi, +24° 47′.					
Oct.	9	23	1	7.42	
	22			7.37	
1 Cassiopeæ, +58° 45′.					
Sept.	4	23	1	24.86	
	24			25.16	
A Piscium, +1° 27′.					
Oct.	24	23	2	22.83	6.0
B. A. C. 8065, +1° 28′.					
Oct.	24	23	3	5.45	8.0
Lalande 45323, +38° 15′.					
Oct.	6	23	3	9.76	7.0
	12			9.79	
Nov.	17			9.52	

(*)+36° 11′.

1877.		h.	m.	s.	Mag.
Sept.	26	23	4	7.17	

WEISSE (2) 34, +36° 11′.

Sept.	26	23	4	8.54	

59 PEGASI, +8° 3′.

Oct.	22	23	5	31.73	5.5

WEISSE 61, +8° 9′.

Nov.	17	23	5	38.04	8.5

.7 ANDROMEDÆ, +48° 44′.

Oct.	6	23	6	55.38	5.0
	9			55.23	
Dec.	15			55.17	

B. A. C. 8091, +27° 24′.

Oct.	24	23	8	57.66	

(*)−5° 24′.

Oct.	12	23	8	57.36	8.5

O. ARG. S. 22721, −21° 52′.

Oct.	9	23	10	4.50	

O. ARG. S. 22723, −21° 52′.

Oct.	9	23	10	18.42	

O. ARG. S. 22727, −19° 32′.

Oct.	22	23	10	29.25	6.5

LALANDE 45588, +37° 18′.

Oct.	6	23	11	3.66	
Dec.	14			3.18	7.5

WEISSE 185, −12° 24′.

Sept.	4	23	11	14.99	7.0
	24			14.73	
	26			14.72	

(*)−6° 15′.

Oct.	24	23	11	24.68	
Nov.	17			24.35	

(*)−6° 20′.

Nov.	16	23	11	34.13	8.2
	17			34.05.	

LACAILLE 9444, −34° 22′.

Dec.	15	23	13	3.46	

(*)−5° 24′.

Oct.	9	23	14	43.87	8.0
	12			43.87	6.0
Nov.	16			43.78	8.2
	17			43.80	8.3

(*)+36° 50′.

1877.		h.	m.	s.	Mag.
Sept.	4	23	14	47.32	8.0
	26			47.59	8.0

B. A. C. 8134, −5° 21′.

Oct.	9	23	15	1.25	
	12			1.13	
	22			1.12	

B. A. C. 8139, +37° 52′.

Oct.	24	23	15	22.71	
Nov.	19			22.79	

LACAILLE 9458, −31° 45′.

Dec.	14	23	17	9.01	
	15			9.03	

WEISSE 359, +5° 22′.

Nov.	17	23	19	6.25	8.3

(*)+66° 15′.

Sept.	4	23	20	26.14	
	26			26.68	
Oct.	12			26.84	

(*)+54° 11′.

Oct.	6	23	20	55.25	

RADCLIFFE 6079, +54° 11′.

Oct.	6	23	21	10.27	

RADCLIFFE 6081, +54° 11′.

Oct.	9	23	21	26.69	7.3
	22			27.05	

(*)+54° 12′.

Oct.	9	23	21	26.72	8.3
	22			26.75	

11 PISCIUM, −2° 27′.

Dec.	14	23	23	8.15	
	15			8.13	

(*)+15° 12′.

Sept.	26	23	25	13.43	9.0
Oct.	12			13.52	9.0
Nov.	16			13.14	9.0
	17			13.18	9.2

LACAILLE 9516, −31° 58′.

Dec.	14	23	26	54.69	
	15			54.56	

(*)+35° 3′.

Sept.	4	23	29	26.84	8.2
Oct.	6			27.05	8.0

WEISSE (2) 639, +35° 6′.

Sept.	4	23	30	57.92	8.0
Oct.	9			58.17	8.3
Nov.	17			57.96	7.0
	19			57.92	

WEISSE (2) 658, +35° 7′.

1877.		h.	m.	s.	Mag.
Sept.	4	23	31	22.30	7.5
Oct.	9			22.42	7.5
Nov.	17			22.28	6.0
	19			22.37	7.0

75 PEGASI, +17° 43′.

Nov.	16	23	31	44.14	5.5
Dec.	14			44.21	5.5
	15			44.28	

i PISCIUM, +4° 58′.

Aug.	28	23	33	37.49	
Sept.	4			37.45	
	26			37.45	
	30			37.47	
Oct.	6			37.46	
	12			37.55	

77 PEGASI, +9° 38′.

Aug.	28	23	37	6.76	6.0
Sept.	26			6.82	5.5

B. A. C. 8252, +52° 28′.

Oct.	9	23	37	6.61	

LALANDE 96496 (1st *), +6° 35′.

Dec.	14	23	37	40.26	

LALANDE 96496 (2d *), +6° 35′.

Dec.	14	23	37	40.28	

(*)+63° 26′.

Sept.	4	23	41	30.26	8.0
Nov.	16			30.37	7.2

O. ARG. S. 23052, −17° 22′.

Dec.	15	23	41	48.82	

GROOMBRIDGE 4142, +63° 6′.

Aug.	28	23	42	9.04	8.0
Oct.	9			9.46	7.5

(*)+63° 6′.

Aug.	28	23	42	16.86	9.0

B. A. C. 8280, +59° 14′.

Oct.	22	23	42	52.63	
	24			52.42	
Nov.	17			52.50	

(*)−32° 4′.

Sept.	30	23	43	37.66	

LACAILLE 9620, −35° 22′.

Dec.	14	23	45	14.80	
	15			14.60	

(*)+20° 56′.

Oct.	12	23	46	8.95	5.5

(*)+21° 3′.

Oct.	12	23	46	25.15	

(*)+34° 17′.

1877.		h.	m.	s.	Mag.
Nov.	19	23	46	31.93	8.2

(*)+20° 51′.

Aug.	28	23	46	58.89	
Sept.	4			58.89	

LALANDE 46811, +34° 22′.

Oct.	22	23	46	59.57	7.7

LALANDE 46836, +38° 38′.

Nov.	17	23	47	50.63	6.0

B. A. C. 8311, −0° 45′.

Oct.	24	23	48	28.89	

LACAILLE 9641, −38° 2′.

Dec.	14	23	48	42.55	

LALANDE 46873, +37° 23′.

Oct.	9	23	48	50.43	

B. A. C. 8314, +73° 44′.

Nov.	16	23	48	51.88	

1 CETI, −16° 32′.

Nov.	19	23	52	1.46	6.0

ω PISCIUM, +6° 11′.

Jan.	5	23	52	59.71	
Sept.	2			59.82	
	30			59.76	
Oct.	22			59.67	
	23			59.71	
	24			59.74	
Nov.	17			59.73	
Dec.	14			59.69	
	15			59.71	

B. A. C. 8355 (1st *), +62° 25′.

Aug.	28	23	56	18.75	
Sept.	30			18.90	
Nov.	16			19.08	
	19			18.88	

B. A. C. 8355 (2d *), +65° 25′.

Aug.	28	23	56	21.12	
Sept.	30			21.13	
Nov.	16			21.10	
	19			21.12	

LACAILLE 9701, −35° 25′.

Nov.	17	23	56	42.18	

LACAILLE 9702, −25° 16′.

Dec.	15	23	56	52.11	

LACAILLE 9706, −29° 56′.

Dec.	14	23	58	2.51	6.0

B. A. C. 8364, +57° 48′.

Oct.	22	23	58	35.02	
	23			35.01	

(*)+57° 42′.

Oct.	23	23	59	50.37	

MEAN DECLINATIONS FOR 1877.0

OF

STARS OBSERVED

WITH THE

MURAL CIRCLE.

1877.

MEAN DECLINATIONS FOR 1877.0,

OF

STARS OBSERVED WITH THE MURAL CIRCLE.

1877.	° ′ ″
B. A. C. 8374, 0^{h} 0^{m} 16^{s}.	
November 30 . .	+28 20 35.2
LALANDE 47298, 0^{h} 1^{m} 24^{m}.	
December 7 . .	+36 30 5.3
8 . .	6.5
5 CETI, 0^{h} 1^{m} 57^{s}.	
November 27 . .	− 3 7 55.7
LACAILLE 9747, 0^{h} 3^{m} 45^{s}.	
September 23 . .	−26 33 33.6
25 . .	34.1
B. A. C. 23, 0^{h} 5^{m} 23.	
December 31 . .	−28 29 5.9
RADCLIFFE 65, 0^{h} 14^{m} 0^{s}.	
November 12 . .	+44 15 21.4
RADCLIFFE 73, 0^{h} 14^{m} 42^{s}.	
September 25 . .	+44 15 18.6
November 12 . .	20.7
December 8 . .	17.2
(*), 0^{h} 15^{m} 20^{s}.	
December 7 . .	+44 14 42.7
8 . .	45.4
LACAILLE 78, 0^{h} 18^{m} 56^{s}.	
November 27 . .	−31 22 12.0
December 20 . .	10.7
LACAILLE 83, 0^{h} 19^{m} 40^{s}.	
December 31 . .	−28 23 26.7
49 PISCIUM, 0^{h} 24^{m} 26^{s}.	
November 6 . .	+15 21 29.8
GROOMBRIDGE 73, 0^{h} 24^{m} 26^{s}.	
September 25 . .	+42 41 50.8
LALANDE 713, 0^{h} 24^{m} 53^{s}.	
September 23 . .	+38 18 4.7
October 16 . .	2.9
B. A. C. 122, 0^{h} 25^{m} 15^{s}.	
1877.	° ′ ″
November 6 . .	+15 20 34.9
LALANDE 849, 0^{h} 28^{m} 37^{s}.	
November 3 . .	+36 9 17.8
27 . .	16.5
WEISSE 446, 0^{h} 28^{m} 40^{s}.	
November 12 . .	+ 3 42 36.1
π ANDROMEDÆ, 0^{h} 30^{m} 21^{s}.	
September 23 . .	+33 2 31.9
October 16 . .	28.8
WEISSE (2) 749, 0^{h} 30^{m} 23^{s}.	
September 25 . .	+33 1 53.9
18 CETI, 0^{h} 39 20^{s}.	
September 23 . .	−13 32 47.2
25 . .	49.0
(*), 0^{h} 42^{m} 19^{s}.	
November 27 . .	+40 27 41.0
December 3 . .	43.1
(*), 0^{h} 42^{m} 32^{s}.	
November 6 . .	+40 24 43.3
December 31 . .	40.7
ν ANDROMEDÆ, 0^{h} 43^{m} 25^{s}.	
October 16 . .	+40 24 29.6
December 31 . .	29.5
LACAILLE 224, 0^{h} 43^{m} 32^{s}.	
November 3 . .	−24 1 57.8
12 . .	57.3
LALANDE 1504, 0^{h} 47^{m} 52^{s}.	
September 23 . .	+38 30 7.8
25 . .	9.4
(*), 0^{h} 51^{m} 41^{s}.	
November 6 . .	+ 1 49 19.4
20 . .	19.7
December 3 . .	16.2
(*), 0^{h} 52^{m} 0^{s}.	
1877.	° ′ ″
November 3 . .	+36 31 (41.0)
12 . .	45.2
December 31 . .	46.7
64 CETI, 0^{h} 52^{m} 36^{s}.	
September 25 . .	−12 2 38.0
October 16 . .	42.1
November 27 . .	40.0
O. ARG. N. 1118, 1^{h} 1^{m} 4^{s}.	
September 23 . .	+54 29 56.7
25 . .	57.9
O. ARG. S. 644, 1^{h} 1^{m} 47^{s}.	
November 12 . .	−28 22 47.8
20 . .	48.5
η CETI, 1^{h} 2^{m} 27^{s}.	
November 13 . .	−10 50 5.5
WEISSE 89, 1^{h} 7^{m} 54^{s}.	
December 3 . .	+ 0 50 45.5
WEISSE 144, 1^{h} 11^{m} 16^{s}.	
September 23 . .	+12 54 30.2
25 . .	31.6
41 CETI, 1^{h} 11^{m} 34^{s}.	
November 12 . .	− 8 18 33.4
13 . .	33.4
20 . .	32.6
(*), 1^{h} 17^{m} 15^{s}.	
December 3 . .	+38 25 4.5
44 CETI, 1^{h} 17^{m} 54^{s}.	
September 23 . .	− 8 38 50.9
25 . .	51.6
(*), 1^{h} 19^{m} 26^{s}.	
December 3 . .	+38 23 9.6
ρ PISCIUM, 1^{h} 19^{m} 41^{s}.	
November 13 . .	+18 31 55.4
(*), 1^{h} 23^{m} 19^{s}.	
1877.	° ′ ″
November 6 . .	−37 28 12.6
12 . .	14.1
(*), 1^{h} 26^{m} 31^{s}.	
November 13 . .	+15 3 50.2
20 . .	47.4
LACAILLE 444, 1^{h} 27^{m} 26^{s}.	
September 23 . .	−24 48 17.1
25 . .	17.1
B. A. C. 479, 1^{h} 29^{m} 16^{s}.	
December 3 . .	−32 31 21.6
B. A. C. 491, 1^{h} 31^{h} 33^{s}.	
November 20 . .	−10 2 3.0
WRISSE 643, 1^{h} 36^{m} 26^{s}.	
September 23 . .	− 9 16 53.9
25 . .	53.3
B. A. C. 563, 1^{h} 44^{m} 34^{s}.	
November 13 . .	−39 1 26.6
20 . .	28.1
LALANDE 3390, 1^{h} 45^{m} 3^{s}.	
September 23 . .	+36 49 29.7
25 . .	30.2
LALANDE 3412, 1^{h} 45^{m} 59^{s}.	
December 3 . .	+36 42 51.1
B. A. C. 578, 1^{h} 48^{m} 9^{s}.	
November 13 . .	−39 12 10.0
20 . .	9.4
56 CETI, 1^{h} 50^{m} 59^{s}.	
December 3 . .	−23 7 44.0
O. ARG. S. 1210, 1^{h} 53^{m} 13^{s}.	
September 23 . .	−18 39 31.9
25 . .	30.2
B. A. C. 643, 1^{h} 59^{m} 1^{s}.	
December 3 . .	−29 53 18.4

1877.		°	′	″
(*), $2^h\ 1^m\ 40^s$.				
November	13	+39	0	27.9
(*), $2^h\ 2^m\ 37^s$.				
November	13	+39	3	49.0
ξ^1 Ceti, $2^h\ 6^m\ 29^s$.				
January	30	+ 8	16	8.7
20 Arietis, $2^h\ 8^m\ 46^s$.				
September	23	+25	12	41.5
	25			40.6
(*), $2^h\ 9^m\ 27^s$.				
November	7	+55	17	55.7
	20			53.0
December	3			52.6
(*), $2^h\ 9^m\ 36^s$.				
October	14	+55	54	31.2
(*), $2^h\ 12^m\ 19^s$.				
November	7	+55	20	33.2
	20			31.5
64 Andromedæ, $2^h\ 16^m\ 15^s$.				
January	29	+49	26	51.5
	30			51.3
February	1			50.5
O. Arg. N. 2729, $2^h\ 17^h\ 41^s$.				
November	13	+56	40	15.1
(*), $2^h\ 17^m\ 46^s$.				
November	13	+56	38	13.9
ξ Arietis, $2^h\ 18^m\ 16^s$.				
September	23	+10	3	10.8
	25			10.9
B. A. C. 750, $2^h\ 19^m\ 37^s$.				
September	23	+10	5	27.6
	25			27.1
O. Arg. S. 1547, $2^h\ 20^m\ 2^s$.				
November	20	−24	31	39.6
December	3			40.5
O. Arg. S. 1554, $2^h\ 20^m\ 22^s$.				
October	14	−24	23	53.8
November	7			53.4
O. Arg. S. 1558, $2^h\ 20^m\ 42^s$.				
November	7	−24	26	11.7
Lacaille 745, $2^h\ 22^m\ 32^s$.				
January	26	−34	26	57.2

1877.		°	′	″
Lacaille 749, $2^h\ 22^m\ 49^s$.				
January	29	−34	21	50.2
	30			47.8
ν Ceti, $2^h\ 29^m\ 19^s$.				
November	13	+ 5	3	20.2
(*), $2^h\ 29^m\ 20^s$.				
February	1	+19	18	31.6
Lacaille 792, $2^h\ 29^m\ 51^s$.				
November	20	−29	14	11.8
December	3			13.5
Weisse (2) 711, $2^h\ 30^m\ 57^s$.				
October	14	+25	40	16.2
B. A. C. 809, $2^h\ 31^m\ 55^s$.				
November	7	−35	6	16.3
Lalande 4903, $2^h\ 32^m\ 18^s$.				
January	26	+14	19	42.6
	29			40.4
	30			40.2
September	23			40.4
	25			40.3
B. A. C. 840, $2^h\ 37^m\ 13^s$.				
January	30	−38	54	33.8
February	1			37.3
Weisse (2) 915, $2^h\ 39^m\ 29^s$.				
October	14	+35	27	55.6
Lacaille 873, $2^h\ 41^m\ 40^s$.				
November	20	−23	0	2.7
December	3			3.7
41 Arietis, $2^h\ 42^m\ 48^s$.				
November	13	+26	45	8.4
O. Arg. S. 1834, $2^h\ 43^m\ 30^s$.				
September	23	−25	7	18.2
	25			19.8
B. A. C. 900, $2^h\ 48^m\ 4^s$.				
January	26	−41	53	47.6
	30			45.6
Lacaille 910, $2^h\ 48^m\ 9^s$.				
October	14	−22	52	36.2
ε Arietis, $2^h\ 52^m\ 11^s$.				
February	6	+20	50	46.7
(*), $2^h\ 52^m\ 30^s$.				
September	23	+14	42	20.0
	25			18.9

1877.		°	′	″
(*), $2^h\ 54^m\ 12^s$.				
October	14	+38	23	23.0
November	13			22.9
(*), $2^h\ 58^m\ 17^s$.				
September	23	+37	6	45.7
	25			44.5
November	20			42.8
December	3			41.8
(*), $2^h\ 59^m\ 44^s$.				
January	29	+50	41	30.6
	30			30.5
February	1			29.8
ν Persei, $3^h\ 0^m\ 6^s$.				
February	3	+49	8	31.5
	6			30.9
(*), $3^h\ 5^m\ 12^s$.				
January	26	+38	30	31.2
September	23			32.4
October	14			29.7
November	13			28.7
	20			30.6
(*), $3^h\ 5^m\ 29^s$.				
January	26	+38	30	19.7
November	13			20.3
(*), $3^h\ 6^m\ 34^s$.				
October	14	+38	30	14.9
	20			14.1
(*), $3^h\ 6^m\ 11^s$.				
September	25	+37	12	44.7
B. A. C. 1005, $3^h\ 8^m\ 33^s$.				
January	29	−30	15	52.3
	30			51.6
February	1			54.3
	3			51.8
Weisse (2) 209, $3^h\ 11^m\ 12^s$.				
November	13	+23	37	50.9
December	3			50.8
τ^4 Eridani, $3^h\ 14^m\ 4^s$.				
September	25	−22	12	23.9
Weisse 240, $3^h\ 14^m\ 44^s$.				
October	14	− 3	33	14.3
65 Arietis, $3^h\ 17^m\ 15^s$.				
February	1	+20	21	56.6
O. Arg. S. 2245, $3^h\ 18^m\ 39^s$.				
January	30	−21	22	3.5
(*), $3^h\ 19^m\ 0^s$.				
February	6	+59	28	27.4

1877.		°	′	″
B. A. C. 1058, $3^h\ 19^m\ 8^s$.				
February	6	+59	30	34.1
(*), $3^h\ 27^m\ 16^s$.				
February	1	+31	36	15.0
	3			14.1
(*), $3^h\ 28^m\ 0^s$.				
January	30	+31	27	35.3
(*), $3^h\ 28^m\ 3^s$.				
November	13	+31	16	23.4
(*), $3^h\ 28^m\ 15^s$.				
November	20	+46	50	59.2
December	3			58.6
(*), $3^h\ 28^m\ (30^s)$.				
December	3	+46	50	58.3
(*), $3^h\ 28^m\ 35^s$.				
October	14	+46	51	8.0
November	20			4.3
(*), $3^h\ 28^m\ 48^s$.				
February	1	+31	37	5.3
	3			4.1
(*), $3^h\ 29^m\ 0^s$.				
January	1	+31	26	4.2
(*), $3^h\ 34^m\ 40^s$.				
February	6	−28	20	46.5
Lacaille 1177, $3^h\ 35^m\ 43^s$.				
February	6	−28	21	57.2
Weisse (2) 776, $3^h\ 36^m\ 58^s$.				
January	30	+44	57	53.3
February	1			54.3
	3			54.5
(*), $3^h\ 38^m\ 23^s$.				
November	7	+23	56	57.9
	20			54.5
(*), $3^h\ 38^m\ (35^s.)$				
November	20	+23	58	53.9
(*), $3^h\ 39^m\ 21^s$.				
November	13	+23	14	26.6
December	3			25.0
Weisse (2) 847, $3^h\ 39^m\ 29^s$.				
January	30	+44	58	19.0
February	1			17.7
	3			19.9
(*), $3^h\ 40^m\ 0^s$.				
October	14	+23	56	50.0

A 27 PLEIADUM, 3^h 41^m 0^s.

1877.		° ′ ″
October	14	+23 56 19.3

GROOMBRIDGE 945, 3^h 45^m 31^s.

February	6	+75 49 5.6

τ^8 ERIDANI, 3^h 48^m 30^s.

November	20	−24 58 39.0

WEISSE (2) 1030, 3^h 48^m 46^s.

February	3	+35 38 35.4

(*), 3^h 49^m 37^s.

February	1	+35 37 3.2
	3	5.5

(*), 3^h 51^m 18^s.

November	13	−27 0 44.9

(*), 3^h 53^m 57^s.

January	30	+35 2 19.3

(*), 3^h 54^m 40^s.

January	30	+35 3 3.3

WEISSE (2) 1143, 3^h 54^m 48^s.

February	6	+35 3 14.7
October	14	15.7
November	7	13.1

WEISSE (2) 1251, 3^h 59^m 56^s.

February	1	+41 9 32.9
	3	33.8

WEISSE (2) 1269, 4^h 0^m 33^s.

February	1	+41 10 28.3
	3	26.8

LACAILLE 1346, 4^h 0^m 49^s.

October	14	−31 23 3.8
November	20	4.4

(*), 4^h 8^m 26^s.

November	13	−31 35 48.0

WEISSE (2) 130, 4^h 8^m 29^s.

February	1	+20 30 37.4
	3	38.4

LALANDE 7987, 4^h 10^m 39^s.

December	3	+16 17 7.5

(*), 4^h 11^m 33^s.

January	30	+17 30 26.1
February	6	26.2
October	14	28.4
November	20	25.9

(*), 4^h 18^m 17^s.

October	14	−25 40 23.7
November	7	24.2
	20	24.7

(*), 4^h 18^m 49^s.

1877.		° ′ ″
January	30	+17 9 55.3
February	1	54.0
	3	55.4

LACAILLE 1449, 4^h 20^m 56^s.

December	3	−35 57 17.3

LACAILLE 1451, 4^h 21^m 47^s.

February	6	−24 21 31.3

WEISSE (2) 506, 4^h 24^m 57^s.

February	1	+35 34 7.4
	3	7.0

B. A. C. 1404, 4^h 25^m 36^s.

October	14	−30 42 43.3
November	20	46.5

LACAILLE 1537, 4^h 32^m 9^s.

December	3	−38 4 26.7

(*), 4^h 34^m 18^s.

January	30	+38 8 32.5

(*), 4^h 34^m 34^s.

January	30	+38 11 19.4
February	6	20.0

(*), 4^h 35^m 38^s.

February	3	−26 0 46.6
October	14	46.5
November	13	46.7
	20	48.1

(*), 4^h 41^m 42^s.

October	14	+10 42 41.4
November	20	40.5

(*), 4^h 42^m 0^s.

February	3	+10 42 38.0

(*), 4^h 42^m 0^s.

February	6	+10 42 0.8

(*), 4^h 43^m 0^s.

February	3	+10 43 7.7

WEISSE 925, 4^h 44^m 13^s.

November	13	+ 1 18 51.9
December	3	51.8

LACALLE 1615, 4^h 45^m 49^s.

February	1	−25 31 13.6

4 AURIGÆ, 4^h 51^m 0^s.

October	14	+37 42 8.9

(*), 4^h 52^m 11^s.

November	20	+38 37 10.4

(*), 4^h 52^m 24^s.

1877.		° ′ ″
February	1	+60 14 23.5
	3	24.4
	6	25.1

(*), 4^h 53^m 22^s.

November	7	+38 36 16.5
December	3	15.3

O. ARG. S. 3576, 4^h 55^m 9^s.

January	30	−29 45 39.6

(* 129) WASHINGTON, 4^h 55^m 39^s.

November	13	+ 5 56 56.2
	20	58.2

(*), 4^h 56^m 42^s.

October	14	+44 52 56.9

(*), 4^h 59^m 2^s.

February	6	−27 49 56.1

15 ORIONIS, 5^h 2^m 41^s.

February	3	+15 26 18.2

LACAILLE 1754, 5^h 7^m 20^s.

February	6	−37 32 44.3

LACAILLE 1770, 5^h 10^m 21^s.

February	3	−28 28 33.7

(*), 5^h 17^m 16^s.

February	3	+37 55 51.1
	6	51.6

(*), 5^h 23^m 18^s.

February	3	−32 31 9.2

O. ARG. S. 4060, 5^h 28^m 0^s.

February	6	−25 27 16.8

(*), 5^h 35^m 52^s.

February	3	+38 12 34.1

(*), 5^h 36^m 37^s.

February	3	+38 11 26.0

(*), 5^h 36^m 43^s.

February	6	+31 14 57.7

(*), 5^h 39^m 10^s.

February	3	+38 7 21.7

(*), 5^h 50^m 5^s.

February	6	+ 7 13 42.1

(*), 12^h 8^m 44^s.

May	23	−28 33 8.8
	29	10.8

(*), 12^h 16^m 31^s.

1877.		° ′ ″
May	29	+26 31 43.4

WEISSE (2) 348, 12^h 17^m 50^s.

May	29	+26 31 58.5

RADCLIFFE 2860, 12^h 19^m 27^s.

May	23	+64 29 3.1

O. ARG. S. 12243, 12^h 27^m 22^s.

May	23	−22 49 55.4

O. ARG. S. 12246, 12^h 27^m 33^s.

May	29	−22 52 6.4

(*), 12^h 41^m 21^s.

May	23	−26 53 25.3
	29	26.8

LACAILLE 5311, 12^h 46^m 22^s.

May	29	−38 43 16.5

O. ARG. S. 12564, 12^h 52^m 53^s.

May	23	−21 27 45.7

(*), 13^h 3^m 45^s.

May	23	−22 58 6.5

(*), 13^h 14^m 27^s.

May	23	+12 53 41.8

(*), 13^h 24^m 33^s.

May	29	−34 39 29.9

B. A. C. 4560, 13^h 34^m 23^s.

May	29	−12 9 31.2

WEISSE III, 626, 13^h 37^m 40^s.

May	23	−12 12 27.5

WEISSE 731, 13^h 44^m 43^s.

May	29	−12 29 54.2

(*), 13^h 46^m 10^s.

May	23	−38 26 57.4

(*), 13^h 57^m 23^s.

May	23	−33 11 2.1
	29	0.6

(*), 13^h 58^m 31^s.

May	23	−33 6 17.2
	29	18.8

LACAILLE 5872, 14^h 9^m 1^s.

June	25	−32 40 5.8

O. Arg. N. 14432, 14^h 11^m 51^s.

1877. ° ′ ″
May 29 . . +51 56 37.9

B. A. C. 4773, 14^h 17^m 55^s.

June 25 . . + 6 22 44.3

Lacaille 5963, 14^h 23^m 35^s.

June 29 . . −38 19 20.6

Lacaille 5988, 14^h 26^m 48^s.

June 25 . . −31 24 51.7

(*), 14^h 29^m 56^s.

May 23 . . −27 42 (18.6)
29 . . 14.0

π^1 Bootis, 14^h 34^m 57^s.

June 25 . . +16 56 47.2
28 . . 47.4
29 . . 48.0

π^2 Bootis, 14^h 34^m 57^s.

June 25 . . +16 56 45.4
28 . . 46.3
29 . . 46.4

Lacaille 6109, 14^h 42^m 18^s.

May 29 . . −31 54 45.5
June 2 . . 47.3
29 . . 47.9

(*), 14^h 43^m 16^s.

June 29 . . −31 57 1.4

Lacaille 6135, 14^h 47^m 9^s.

June 25 . . −33 38 17.8
28 . . 16.1

Weisse (2) 1154, 14^h 53^m 42^s.

June 28 . . +43 54 23.6

(*), 14^h 54^m 31^s.

June 25 . . +43 54 14.3

4 Bootis, 14^h 59^m 13^s.

June 29 . . +27 25 41.0

(*), 15^h 5^m 5^s.

June 25 . . −25 9 0.0

ι^2 Libræ, 15^h 6^m 20^s.

June 2 . . −19 10 59.3

B. A. C. 5006, 15^h 6^m 38^s.

June 29 . . −25 43 52.6

O. Arg. S. 14487, 15^h 15^m 5^s.

1877. ° ′ ″
June 28 . . −29 56 7.8

ϕ^2 Lupi, 15^h 15^m 20^s.

June 25 . . −36 24 57.8
July 12 . . 55.8

(*), 15^h 17^m 4^s.

June 29 . . −37 3 46.5

(*), 15^h 18^m 1^s.

June 29 . . −37 2 51.1

Radcliffe 3387, 15^h 22^m 15^s.

June 12 . . +44 26 14.6
28 . . 11.2
July 12 . . 14.6

Lacaille 6410, 15^h 24^m 34^s.

June 25 . . −37 39 0.8

40 Libræ, 15^h 31^m 8^s.

June 2 . . −29 22 17.5

κ Libræ, 15^h 34^m 53^s.

July 13 . . −19 16 39.4
14 . . 42.7

Lacaille 6495, 15^h 35^m 50^s.

June 25 . . −30 8 26.6

Lalande 28740, 15^h 37^m 21^s.

June 28 . . +66 11 27.0
29 . . 25.3
July 12 . . 26.8

(*), 15^h 42^m 47^s.

July 13 . . − 2 51 18.3

A Scorpii, 15^h 46^m 16^s.

June 25 . . −24 57 29.0
28 . . 28.9

3 Scorpii, 15^h 47^m 19^s.

June 29 . . −24 52 38.9

Weisse (2) 1180, 15^h 47^m 48^s.

July 12 . . +43 1 13.3
14 . . 11.0

B. A. C. 5296, 15^h 52^m 2^s.

July 13 . . −29 43 44.0

O. Arg. S. 15194, 15^h 58^m 17^s.

July 14 . . −23 53 2.6

O. Arg. N. 15872, 15^h 59^m 32^s.

1877. ° ′ ″
July 12 . . +69 33 19.9

O. Arg. N. 15882, 15^h 59^m 54^s.

July 12 . . +69 34 2.0

B. A. C. 5357, 16^h 1^m 54^s.

July 13 . . −39 48 7.9

B. A. C. 5411, 16^h 7^m 22^s.

July 14 . . +36 44 37.3

σ Cor. Borealis (1st *), 16^h 10^m 6^s.

July 30 . . +34 10 12.1
31 . . 13.0
August 3 . . 11.7

σ Cor. Borealis (2d *), 16^h 10^m 6^s.

July 30 . . +34 10 16.2
31 . . 16.8
August 3 . . 16.9

(*), 16^h 12^m 12^s.

July 12 . . +37 10 52.0

(*), 16^h 13^m 14^s.

July 12 . . +37 13 28.4
13 . . 27.9

(*), 16^h 17^m 50^s.

June 29 . . −23 9 43.7

O. Arg. S. 15615, 16^h 18^m 2^s.

June 2 . . −23 10 (32.6)
29 . . 28.8

ρ Ophiuchi (1st *), 16^h 18^m 15^s.

July 31 . . −23 9 44.4

ρ Ophiuchi (2d *), 16^h 18^m 15^s.

July 31 . . −23 9 38.8

O. Arg. S. 15621, 16^h 18^m 16^s.

June 28 . . −23 7 11.3
July 14 . . 11.8

Weisse (2) 616, 16^h 21^m 8^s.

July 13 . . +38 11 33.8

ω Ophiuchi, 16^h 24^m 53^s.

August 3 . . −21 12 4.3

Weisse (2) 787, 16^h 27^m 10^s.

June 25 . . +38 19 42.7

Lacaille 6894, 16^h 28^m 35^s.

July 13 . . −35 39 40.2

(*), 16^h 30^m 49^s.

1877. ° ′ ″
June 28 . . −28 40 35.2

(*), 16^h 30^m 52^s.

July 12 . . −28 37 53.5

O. Arg. S. 15790, 16^h 31^m 26^s.

June 28 . . −28 39 20.2

B. A. C. 5562, 16^h 32^m 30^s.

July 12 . . −28 41 39.2

Lacaille 6930, 16^h 33^m 50^s.

August 4 . . −32 54 13.1

B. A. C. 5572, 16^h 34^m 20^s.

July 13 . . −30 17 19.9

Radcliffe 3588, 16^h 35^m 12^s.

June 29 . . +49 6 19.1
30 . . 20.3
August 3 . . 21.5

(*), 16^h 35^m 15^s.

July 14 . . −30 9 23.8

B. A. C. 5608, 16^h 38^m 16^s.

June 25 . . −26 25 11.3

Lacaille 6999, 16^h 42^m 45^s.

July 31 . . −37 17 56.4

(*), 16^h 44^m 41^s.

July 12 . . −21 7 13.6

Lacaille 7023, 16^h 45^m 10^s.

August 4 . . −33 4 27.5

O. Arg. S. 16060, 16^h 45^m 55^s.

August 3 . . −30 11 58.3

(*), 16^h 46^m 19^s.

June 28 . . −29 10 54.4

Lalande 30745, 16^h 47^m 9^s.

June 25 . . +38 9 35.9

O. Arg. S. 16088, 16^h 47^m 26^s.

June 30 . . −29 6 18.4

B. A. C. 5700 (1st *), 16^h 49^m 52^s.

July 31 . . −19 20 36.8

(*), $16^h\ 50^m\ 21^s$.

1877.		°	′	″
July	14	−30	1	14.8
August	4			15.4

B. A. C. 5718, $16^h\ 53^m\ 57^s$.

June	29	−31	57	31.7

B. A. C. 5721, $16^h\ 54^m\ 33^s$.

July	13	−32	4	33.5

(*), $16^h\ 56^m\ 33^s$.

June	28	−20	17	47.8

28 OPHIUCHI, $16^h\ 56^m\ 33^s$.

July	14	−25	31	14.9

(*), $16^h\ 56^m\ 41^s$.

June	30	−20	17	52.1

31 OPHIUCHI, $16^h\ 57^m\ 11^s$.

June	25	−25	28	6.0
July	14			4.5

WEISSE (2) 1735, $16^h\ 57^m\ 17^s$.

August	3	+25	40	47.9
	4			49.7

60 HERCULIS, $16^h\ 59^m\ 41^s$.

August	21	+12	54	42.8

O. ARG. S 16420, $17^h\ 4^m\ 0^s$.

July	31	−26	32	49.3
August	3			50.4

B. A. C. 5800, $17^h\ 6^m\ 37^s$.

August	4	−26	50	5.3

α^2 HERCULIS, $17^h\ 9^m\ 2^s$.

July	12	+14	31	55.7
	13			56.0
August	21			55.0

B. A. C. 5818, $17^h\ 9^m\ 3^s$.

June	30	−30	12	42.9
July	14			40.4

(*), $17^h\ 9^m\ 19^s$.

June	28	−35	24	34.2

(*), $17^h\ 9^m\ 26^s$.

June	28	−35	23	52.1

(*), $17^h\ 16^m\ 6^s$.

August	3	+35	29	41.4

(*), $17^h\ 16^m\ 50^s$.

1877.		°	′	″
July	14	+35	19	28.4
	31			31.6
August	4			29.9

B. A. C. 5875, $17^h\ 18^m\ 26^s$.

August	21	−28	18	10.5

(*), $17^h\ 20^m\ 1^s$.

June	30	+ 2	11	36.9
July	12			40.1

(*), $17^h\ 26^m\ 30^s$.

August	4	−38	31	48.3

O. ARG. S. 16958, $17^h\ 27^m\ 23^s$.

June	30	−18	8	(3.2)
July	12		7	59.8
	13			59.7
August	4			59.3

(*), $17^h\ 27^m\ 30^s$.

August	4	−38	30	36.5

B. A. C. 5932, $17^h\ 28^m\ 7^s$.

August	18	−38	32	42.6

B. A. C. 5960, $17^h\ 32^m\ 4^s$.

July	14	−32	7	45.0
	31			45.3
August	3			46.8

(*), $17^h\ 32^m\ 16^s$.

July	14	−32	11	4.9
August	3			8.8

B. A. C. 5964, $17^h\ 32^m\ 52^s$.

July	31	−32	8	43.7

LALANDE 32322, $17^h\ 35^m\ 30^s$.

July	13	+37	16	47.2

(*), $17^h\ 37^m\ 9^s$.

August	21	+68	33	32.4

(*), $17^h\ 37^m\ 21^s$.

August	4	+68	31	1.7

O. ARG. N. 17419, $17^h\ 37^m\ 19^s$.

June	30	+68	26	53.4
July	12			57.0
August	18			56.7

(*), $17^h\ 42^m\ 15^s$.

July	31	−30	55	7.7

(*), $17^h\ 43^m\ 7^s$.

July	31	−30	55	2.8

WEISSE (2) 1394, $17^h\ 43^m\ 30^s$.

1877.		°	′	″
July	13	+36	9	30.1

WEISSE (2) 1398, $17^h\ 43^m\ 49^s$.

July	13	+36	11	38.9

B. A. C. 6029, $17^h\ 44^m\ 1^s$.

September	3	−34	45	48.8

LACAILLE 7464, $17^h\ 44^m\ 43^s$.

August	3	−34	59	7.5

B. A. C. 6037, $17^h\ 44^m\ 57^s$.

August	4	−34	41	53.7

B. A. C. 6038, $17^h\ 45^m\ 0^s$.

July	12	−34	51	45.4
	14			45.7

(*), $17^h\ 45^m\ 5^s$.

June	30	−34	35	20.5

(*), $17^h\ 45^m\ 12^s$.

August	3	−34	59	6.2

(*), $17^h\ 45^m\ 15^s$.

July	12	−34	50	1.0
	14			2.2

(*), $17^h\ 45^m\ 15^s$.

August	4	−34	39	36.3

(*), $17^h\ 45^m\ 32^s$.

September	3	--34	44	47.5

B. A. C. 6042 (2d *), $17^h\ 45^m\ 34^s$.

September	3	−34	45	17.5

(*), $17^h\ 46^m\ 4^s$.

August	21	+ 8	43	12.5

B. A. C. 6045, $17^h\ 46^m\ 11^s$.

July	12	−34	50	56.9
	14			56.7

(*), $17^h\ 46^m\ 38^s$.

June	30	−34	30	53.1

O. ARG. S. 17394, $17^h\ 50^m\ 4^s$.

August	18	−25	3	45.2

B. A. C. 6070, $17^h\ 50^m\ 37^s$.

July	13	−36	50	34.3

(*), $17^h\ 52^m\ 43^s$.

August	20	+76	31	3.8

O. ARG. S. 17506 (1st *), $17^h\ 54^m\ 56^s$.

1877.		°	′	″
July	31	−23	1	42.2

O. ARG. S. 17506 (2d *), $17^h\ 54^m\ 56^s$.

July	31	−23	1	35.7
August	21			33.2

ψ^2 DRACONIS, $17^h\ 57^m\ 19^s$.

September	3	+72	0	57.6

(*), $17^h\ 57^m\ 19^s$.

August	3	−23	36	5.1

(*), $17^h\ 57^m\ 22^s$.

August	4	−23	35	56.7

B. A. C. 6125, $17^h\ 59^m\ 51^s$.

August	18	−21	27	12.2

LALANDE 33210, $18^h\ 1^m\ 18^s$.

August	18	−21	27	48.4

(*), $18^h\ 4^m\ 25^s$.

July	31	−20	23	43.3
August	20			41.6
	21			41.8

O. ARG. S. 17817, $18^h\ 5^m\ 20^s$.

July	14	−21	0	52.2
August	3			49.3
	4			50.7

LALANDE 33592, $18^h\ 8^m\ 21^s$.

July	12	+38	34	2.3
	13			3.8

η SAGITTARII, $18^h\ 9^m\ 21^s$.

September	21	−36	47	48.8

O. ARG. S. 17956, $18^h\ 9^m\ 26^s$.

August	18	−18	50	38.4

(*), $18^h\ 9^m\ 40^s$.

September	3	−18	35	22.9

(*), $18^h\ 11^m\ 19^s$.

September	3	−18	35	23.2

LACAILLE 7662, $18^h\ 12^m\ 34^s$.

August	20	−38	32	16.1

(*), $18^h\ 16^m\ 33^s$.

July	31	−29	35	12.0
August	3			9.3

(*), $18^h\ 16^m\ 34^s$.

July	31	−29	36	7.9
August	3			10.0

Star	1877.		° ′ ″
(*), 18^h 21^m 16^s.	September	3	−31 37 59.7
B. A. C. 6270 (1st *), 18^h 21^m 18^s.	August	4	−26 39 24.1
		21	20.6
B. A. C. 6270 (2d *), 18^h 21^m 18^s.	August	4	−26 40 5.7
(*), 18^h 25^m 18^s.	July	31	−36 53 33.6
(*), 18^h 25^m 20^s.	August	3	−36 51 11.9
	September	3	10.2
B. A. C. 6321, 18^h 28^m 9^s.	August	4	−29 47 39.5
Lalande 34412, 18^h 28^m 41^s.	August	20	+37 20 21.8
B. A. C. 6343, 18^h 31^m 4^s.	September	21	−23 36 27.9
(*), 18^h 34^m 39^s.	September	3	+72 13 22.0
(*), 18^h 35^m 52^s.	July	31	− 1 6 7.5
	August	3	9.6
O. Arg. N. 18534, 18^h 36^m 33^s.	August	18	+72 18 22.1
		20	19.6
		21	22.7
Weisse 887, 18^h 36^m 53^s.	July	31	− 1 4 12.8
	August	4	13.2
(*), 18^h 37^m 21^s.	August	20	+72 17 44.3
		21	53.6
Lalande 35006, 18^h 38^m 10^s.	August	18	+72 16 11.1
		20	9.3
		21	10.7
(*), 18^h 38^m 18^s.	August	3	− 1 7 13.4
6 Aquilæ, 18^h 40^m 41^s.	September	21	− 4 52 39.4

Star	1877.		° ′ ″
33 Sagittarii, 18^h 46^m 42^s.	September	22	−21 30 30.1
B. A. C. 6435, 18^h 47^m 4^s.	September	21	−37 32 19.6
(*), 18^h 47^m 52^s.	July	31	−33 24 43.4
	August	3	42.0
		20	42.8
(*), 18^h 48^m 15^s.	July	31	−33 25 25.0
	August	3	23.6
		20	24.6
Lacaille 7926, 18^h 48^m 40^s.	August	4	−33 29 7.9
		18	5.1
(*), 18^h 48^m 53^s.	August	4	−33 28 16.5
(*), 18^h 50^m (42^s).	September	3	−22 8 6.8
(*), 18^h 52^m 25^s.	August	21	− 8 24 18.0
B. A. C. 6499, 18^h 56^m 34^s.	September	22	−31 13 30.5
O. Arg. S. 19104, 19^h 0^m 49^s.	July	31	−21 58 43.7
	August	3	46.2
Weisse 1549, 19^h 1^m 37^s.	August	18	− 1^h 28 7.9
O. Arg. S. 19140, 19^h 2^m 2^s.	August	20	−15 28 31.5
		21	34.3
O. Arg. S. 19202, 19^h 4^m 10^s.	August	4	−29 44 14.8
	September	3	14.4
		21	16.1
O. Arg. S. 19256, 19^h 6^m 19^s.	September	22	−22 46 16.6
B. A. C. 6569, 19^h 6^m 57^s.	October	1	−29 26 59.4
Lacaille 8045, 19^h 7^m 43^s.	October	5	−33 44 29.0
Lalande 36238, 19^h 9^m 30^s.	October	2	+36 12 49.2

Star	1877.		° ′ ″
(*), 19^h 11^m 34^s.	August	18	+38 28 50.1
		20	47.6
		21	48.0
Gr. Cat. 1710, 19^h 13^m 21^s.	July	31	+46 46 8.8
	August	3	6.6
		4	8.4
Weisse 345, 19^h 15^m 41^s.	September	21	− 8 25 54.7
Lacaille 8090, 19^h 15^m 46^s.	September	3	−35 12 2.0
	October	1	0.9
(*), 19^h 17^m 13^s.	September	21	− 8 27 9.7
(*), 19^h 19^m 20^s.	August	20	+36 55 32.1
Weisse (2) 556, 19^h 19^m 21^s.	August	18	+36 55 50.1
	September	22	46.2
(*), 19^h 19^h 46^s.	August	18	+36 53 26.4
Lalande 36732, 19^h 20^m 10^s	October	1	+36 56 51.7
		2	51.9
		5	49.1
(*), 19^h 20^m 17^s.	October	2	+36 53 31.6
(*), 19^h 20^m 47^s.	August	20	+36 52 51.7
(*), 19^h 20^m 59^s.	September	22	+36 57 32.5
(*), 19^h 22^m 18^s.	August	3	+34 55 54.9
		4	56.0
(*), 19^h 24^m 15^s.	August	21	+36 56 15.5
(*), 19^h 30^m 20^s.	August	4	+38 57 54.2
(*), 19^h 30^m 23^s.	August	4	+39 0 5.1
(*), 19^h 31^m 0^s.	September	21	−10 14 54.9
		22	55.5
	October	1	53.2

Star	1877.		° ′ ″
(*), 19^h 32^m 0^s.	August	18	−10 25 52.8
		20	55.8
e^1 Sagittarii, 19^h 33^m.35^s.	October	5	−16 34 24.4
O. Arg. S. 19857, 19^h 33^m 45^s.	October	2	−16 33 50.4
		5	50.3
Lacaille 8196, 19^h 35^m 26^s.	September	21	−37 49 34.9
		22	36.5
e^2 Sagittarii, 19^h 35^m 28^s.	October	17	−16 24 37.7
(*), 19^h 39^m 27^s.	August	4	+38 5 7.3
		18	8.6
Weisse 1068, 19^h 43^m 32^s.	October	5	−14 13 57.3
Lalande 37785, 19^h 44^m 11^s.	October	1	+35 0 10.6
57 Sagittarii, 19^h 45^m 6^s.	October	17	−19 21 19.5
Weisse 1208, 19^h 49^m 0^s.	August	18	− 9 4 22.9
	September	21	25.0
(*), 19^h 49^m 24^s.	October	15	−37 4 4.5
(*), 19^h 49^m 30^s.	September	22	−38 4 19.7
	October	2	20.3
(*), 19^h 49^m 42^s.	August	20	−37 59 13.8
	October	13	17.5
B. A. C. 6844, 19^h 51^m 56^s.	October	18	−43 22 38.0
B. A. C. 6857, 19^h 52^m (37^s).	October	2	+40 2 19.3
Lalande 38175, 19^h 53^m 19^s.	October	15	+37 47 23.5
(*), 19^h 55^m 21^s.	September	21	+34 57 37.2
		22	37.0
(*), 19^h 56^m 47^s.	September	22	+34 59 26.4

(*), 19^h 57^m 21^s.

1877. ° ′ ″
October 1 . . +34 58 13.3
13 . . 10.9

(*), 19^h 57^m 21^s.

October 1 . . +34 56 35.3

(*), 19^h 57^m 26^s.

September 21 . . +34 59 27.9
October 1 . . 28.2

(*), 19^h 57^m 46^s.

August 18 . . +34 58 5.0

(*), 19^h 57^m 54^s.

October 16 . . −19 7 3.3
17 . . 3.2

(*), 19^h 58^m 59^s.

October 16 . . −19 3 9.5
17 . . 14.8

(*), 19^h 59^m 20^s.

October 5 . . +30 53 44.3

(*), 20^h 3^m 47^s.

October 15 . . − 9 14 0.3

(*), 20^h 4^m 30^s.

October 18 . . − 6 12 11.8

WEISSE XX, 46, 20^h 4^m 33^s.

August 18 . . − 9 12 14.6
20 . . 18.0

LALANDE 38708, 20^h 5^m 26^s.

September 21 . . +38 46 30.2

ξ² CAPRICORNI, 20^h 5^m 36^s.

October 5 . . −12 58 33.7
17 . . 35.6

WEISSE (2) 189, 20^h 5^m 48^s.

September 22 . . +38 43 30.6

WEISSE 135, 20^h 8^m 0^s.

October 1 . . −11 15 40.8

(*), 20^h 9^m 46^s.

October 15 . . +46 20 22.4

WEISSE (2) 412, 20^h 11^m 54^s.

October 2 . . +36 40 40.8
18 . . 42.6

(*), 20^h 13^m 27^s.

August 21 . . −33 7 22.8
October 13 . . 25.9

(*), 20^h 14^m 55^s.

October 16 . . −33 3 28.6

(*), 20^h 15^m 9^s.

1877. ° ′ ″
August 18 . . +36 44 31.7
20 . . 30.3
September 21 . . 29.3
22 . . 29.4
October 2 . . 29.2
17 . . 28.8

B. A. C. 7006, 20^h 15^m 14^s.

September 21 . . +36 44 44.8
22 . . 44.5
October 2 . . 46.1

(*), 20^h 16^m 55^s.

September 22 . . +36 45 (57.0)
October 17 . . 46 3.1

(*), 20^h 17^m 6^s.

October 18 . . +36 44 47.3

(*), 20^h 19^m 53^s.

October 5 . . +64 17 55.8
November 3 . . 55.5

O. ARG. S. 20578, 20^h 25^m 0^s.

August 21 . . −25 16 59.4

LACAILLE 8471, 20^h 25^m 13^s.

October 13 . . −41 56 3.8

B. A. C. 7087, 20^h 27^m 24^s.

October 18 . . −14 8 30.7

(*), 20^h 32^m 24^s.

October 2 . . −27 21 29.3
5 . . 31.0

LACAILLE 8513, 20^h 32^m 29^s.

August 21 . . −36 13 44.4
September 21 . . 47.0

1 AQUARII, 20^h 33^m 9^s.

November 3 . . + 0 3 20.8

(*), 20^h 33^m 22^s.

September 22 . . +27 21 24.4

(*), 20^h 34^m 7^s.

October 1 . . +37 45 49.7
13 . . 51.8

(*), 20^h 38^m 38^s.

October 5 . . −21 17 45.8

O. ARG. S. 20819, 20^h 39^m 6^s.

October 2 . . −24 10 11.1
15 . . 14.3

(*), 20^h 41^m 29^s.

October 18 . . −19 30 36.2

O. ARG. S. 20896, 20^h 44^m 6^s.

1877. ° ′ ″
October 1 . . −27 36 29.1
5 . . 28.6

(*), 20^h 44^m 35^s.

September 22 . . +38 50 0.8
October 13 . . 1.3

(*), 20^h 49^m 8^s.

September 21 . . −19 30 9.0
October 16 . . 7.5
November 3 . . 4.7

WEISSE 1359, 20^h 54^m 24^s.

September 22 . . −14 0 35.3
October 1 . . 32.8
13 . . 34.9
15 . . 35.6

(*), 20^h 57^m 31^s.

October 16 . . +37 15 37.5

(*), 20^h 57^m 36^s.

September 21 . . +37 10 37.5
October 2 . . 38.7
5 . . 38.2

δ MICROSCOPII, 20^h 58^m 38^s.

November 3 . . −30 36 44.9
6 . . 43.6

f¹ CYGNI, 21^h 2^m 24^s.

October 17 . . +47 9 18.1

(*), 21^h 4^m 10^s.

October 2 . . −12 13 42.3
13 . . 41.3

(*), 21^h 5^m 50^s.

October 2 . . −12 15 42.5

LACAILLE 8719, 21^h 5^m 14^s.

October 18 . . −39 55 28.5

LACAILLE 8742, 21^h 8^m 10^s.

November 6 . . −36 43 9.2

LACAILLE 8758, 21^h 10^m 4^s.

November 3 . . −31 15 29.8

LACAILLE 8760, 21^h 10^m 6^s.

September 21 . . −39 20 31.2
October 5 . . 28.6
November 12 . . 31.5

O. ARG. S. 21286, 21^h 11^m 42^s.

September 22 . . −29 16 44.3

(*), 21^h 16^m 4^s.

1877. ° ′ ″
October 15 . . +48 49 53.6
16 . . 52.9

(*), 21^h 16^m 47^s.

October 1 . . −11 6 42.8

WEISSE 364, 21^h 17^m 10^s.

November 6 . . −11 13 18.7
12 . . 22.5

(*), 21^h 18^m 50^s.

September 21 . . +38 46 14.7

(*), 21^h 18^m 57^s.

September 22 . . +38 4 32.3

(*), 21^h 20^m 17^s.

October 17 . . +36 9 32.8
18 . . 34.4
November 3 . . 33.4

(*), 21^h 20^m 42^s.

October 13 . . −12 15 40.9

69 CYGNI, 21^h 20^m 50^s.

October 17 . . +36 8 13.4

(*), 21^h 25^m 3^s.

November 6 . . −25 46 3.5
12 . . 2.6

LALANDE 42034, 21^h 28^m 38^s.

September 21 . . +37 58 57.0
22 . . 55.7

72 CYGNI, 21^h 29^m 47^s.

September 21 . . +37 59 0.7
22 . . 58 58.4

(*), 21^h 33^m 4^s.

November 3 . . −35 4 36.2

LACAILLE 8873, 21^h 33^m 6^s.

October 13 . . −35 5 12.1
16 . . 13.6
November 3 . . 13.2

d AQUARII, 21^h 33^m 21^s.

October 18 . . + 1 41 31.8

WEISSE (2) 871, 21^h 35^m 53^s.

October 1 . . +34 7 1.3
2 . . 0.7

(*), $21^h\ 36^m\ 11^s$.

1877.		°	′	″
October	1 . .	+34	8	24.5
	5 . .			31.7
November	6 . .			33.6
	12 . .			28.9

(*), $21^h\ 37^m\ 0^s$.

October	16 . .	+36	59	27.2
	17 . .			28.3

(*), $21^h\ 40^m\ 4^s$.

September	21 . .	−18	57	50.8
	22 . .			49.2

B. A. C. 7599, $21^h\ 43^m\ 5^s$.

November	30 . .	−13	17	41.3

WEISSE (2) 1100, $21^h\ 45^m\ 50^s$.

October	2 . .	+39	2	6.3
	13 . .			7.2

WEISSE (2) 1102, $21^h\ 46^m\ 0^s$.

October	1 . .	+38	57	43.0
	5 . .			41.4

WEISSE (2) 1196, $21^h\ 50^m\ 10^s$.

October	17 . .	+35	33	54.7
November	3 . .			54.7

(*), $21^h\ 52^m\ 23^s$.

November	12 . .	+48	5	1.6

(*), $21^h\ 52^m\ 32^s$.

October	16 . .	−20	35	30.1
November	6 . .			29.3

η PISCIS AUSTRALIS, $21^h\ 53^m\ 49^s$.

October	18 . .	−29	2	34.4

30 AQUARII, $21^h\ 56^m\ 51^s$.

October	2 . .	− 7	6	57.3
	5 . .			56.1
November	30 . .			56.8

o AQUARII, $21^h\ 57^m\ 0^s$.

November	3 . .	− 2	44	52.5

LACAILLE 9012, 21^h 57 39^s.

October	1 . .	−29	1	47.6

O. ARG. N. 23385, $22^h\ 1^m\ 31^s$.

September	21 . .	+53	1	30.1
	22 . .			29.8

B. A. C. 7729, $22^h\ 4^m\ 32^s$.

November	12 . .	−27	45	21.5

(*), $22^h\ 4^m\ 50^s$.

1877.		°	′	″
October	5 . .	+71	46	9.5
	13 . .			10.3

39 AQUARII, $22^h\ 5^m\ 50^s$.

December	7 . .	−14	47	56.0

O. ARG. S. 21975, $22^h\ 6^m\ 5^s$.

November	30 . .	−26	56	0.3

24 CEPHEI, $22^h\ 7^m\ 28^s$.

December	8 . .	+71	44	7.8
	10 . .			8.6

PIAZZI 33, $22^h\ 8^m\ 26^s$.

October	1 . .	+16	35	1.3
	2 . .		34	59.8
	17 . .		35	0.3

(*), $22^h\ 10^m\ 56^s$.

October	16 . .	+37	45	41.2

(*), $22^h\ 11^m\ 6^s$.

November	3 . .	+37	45	28.6
	6 . .			30.7

(*), $22^h\ 14^m\ 54^s$.

October	17 . .	−35	8	20.4
November	12 . .			22.9

(*), $22^h\ 15^m\ 1^s$.

September	21 . .	−35	6	31.6
November	12 . .			33.1

(*), $22^h\ 15^m\ 2^s$.

September	22 . .	−35	3	25.7

LACAILLE 9119, $22^h\ 17^m\ 28^s$.

December	7 . .	−39	45	0.3

(*), $22^h\ 17^m\ 31^s$.

October	2 . .	+36	45	41.5
November	30 . .			42.7

B. A. C. 7810, $22^h\ 18^m\ 8^s$.

October	13 . .	+66	5	6.0

LACAILLE 7817, $22^h\ 19^m\ 24^s$.

December	8 . .	−24	18	24.4
	10 . .			25.1

(*), $22^h\ 20^m\ 21^s$.

November	6 . .	+38	35	59.9

(*), $22^h\ 20^m\ 42^s$.

1877.		°	′	″
November	3 . .	+38	35	46.0

ζ AQUARII (1st *), $22^h\ 22^m\ 33^s$.

December	12 . .	− 0	38	53.6

26 CEPHEI, $22^h\ 23^m\ 12^s$.

September	22 . .	+64	30	18.5
October	1 . .			20.5
	17 . .			18.5

LACAILLE 9159, $22^h\ 24^m\ 6^s$.

October	18 . .	−31	39	14.3

WEISSE 518, $22^h\ 26^m\ 9^s$.

October	16 . .	+ 6	46	20.0

60 AQUARII, $22^h\ 27^m\ 45^s$.

November	30 . .	− 2	12	22.3
December	7 . .			24.0

(*), $22^h\ 30^m\ 36^s$.

October	13 . .	−13	42	4.1

(*), $22^h\ 30^m\ 36^s$.

November	6 . .	+36	7	35.7

LACAILLE 9190, $22^h\ 31^m\ 5^s$.

December	8 . .	−34	6	26.1

LACAILLE 9195, $22^h\ 31^m\ 25^s$.

October	5 . .	−26	17	34.5

LACAILLE 9199, $22^h\ 31^m\ 57^s$.

October	18 . .	−29	23	10.5

26 CEPHEI, $22^h\ 33^m\ 11^s$.

October	1 . .	+64	30	20.5
	17 . .			18.5

B. A. C. 7895, $22^h\ 33^m\ 32^s$.

December	10 . .	−31	17	35.9
	12 . .			34.2

η PEGASI, $22^h\ 37^m\ 17^s$.

December	18 . .	+29	34	42.1

(*), $22^h\ 38^m\ 6^s$.

November	3 . .	+50	50	7.1

(*), $22^h\ 38^m\ (14^s)$.

October	13 . .	−14	15	14.2

(*), $22^h\ 38^m\ 29^s$.

1877.		°	′	″
October	2 . .	−14	16	57.4
	5 . .			56.5

(*), $22^h\ 38^m\ 41^s$.

November	6 . .	−21	30	57.1

(*), $22^h\ 38^m\ 42^s$.

November	3 . .	+50	48	7.9

(*), $22^h\ 38^m\ 53^s$.

October	17 . .	−14	14	14.1

(*), $22^h\ 38^m\ 55^s$.

November	13 . .	−14	13	1.5

(*), $22^h\ 40^m\ 14^s$.

November	12 . .	−21	6	18.0

LACAILLE 9256, $22^h\ 41^m\ 12^s$.

December	8 . .	−26	33	23.9
	10 . .			25.6
	12 . .			23.8

LACAILLE 9269, $22^h\ 42^m\ 39^s$.

October	18 . .	−23	44	30.2

LACAILLE 9307, $22^h\ 49^m\ 36^s$.

December	8 . .	−32	12	59.3
	10 . .		13	0.4
	12 . .		12	58.7

(*), $22^h\ 49^m\ 38^s$.

October	13 . .	−26	51	58.0
	17 . .			58.6

LACAILLE 9315 (1st *), $22^h\ 51^m\ 12^s$.

October	2 . .	−26	49	25.9
	5 . .			25.7
November	12 . .			26.2
	30 . .			23.6
December	7 . .			25.6

LALANDE 44918, $22^h\ 51^m\ 57^s$.

October	18 . .	+38	43	55.4
November	3 . .			53.9
	6 . .			56.7

2 PISCIUM, $22^h\ 53^m\ 12^s$.

December	18 . .	+ 0	18	23.9
	20 . .			22.5

LACAILLE 9357, $22^h\ 57^m\ 1^s$.

December	8 . .	−27	28	33.8
	10 . .			33.6

B. A. C. 8045, $22^h\ 59^m\ 56^s$.

October	17 . .	−39	33	25.5
November	30 . .			19.9

LACAILLE 9373, $23^h\ 0^m\ 19^s$.

1877.		°	′	″
October	18	−30	42	43.3

h^4 AQUARII, $23^h\ 0^m\ 51^s$.

October	13	− 8	21	25.9

c^2 AQUARII, $23^h\ 2^m\ 56^s$.

December	7	−21	50	23.7
	12			22.0
	20			22.0

O. ARG. S. 26656, $23^h\ 4^m\ 38^s$.

November	3	−27	34	53.5

O. ARG. S. 22657, $23^h\ 4^m\ 39^s$.

November	6	−27	33	25.9

LACAILLE 9414, $23^h\ 9^m\ 8^s$.

December	8	−30	31	2.2
	10			2.7

LACAILLE 9424, $23^h\ 10^m\ 7^s$.

November	30	−41	51	55.4

γ SCULPTORIS, $23^h\ 11^m\ 36^s$.

December	20	−33	12	6.0

(*), $23^h\ 11^m\ 37^s$.

October	5	− 6	11	29.9

(*), $23^h\ 11^m\ 37^s$.

October	13	− 6	11	19.3

LACAILLE 9436, $23^h\ 12^m\ 21^s$.

December	12	−29	24	45.5

(*), $23^h\ 12^m\ 37^s$.

November	12	− 6	11	15.2

B. A. C. 8123, $23^h\ 13^m\ 55^s$.

1877.		°	′	″
December	8	− 4	35	18.5

(*), $23^h\ 14^m\ 47^s$.

November	3	− 5	26	31.7
	6			33.7

B. A. C. 8134, $23^h\ 15^m\ 6^s$.

October	17	− 5	20	41.0
	18			40.8

B. A. C. 8139, $23^h\ 15^m\ 24^s$.

November	27	+37	54	31.4
December	7			32.6

LACAILLE 9458, $23^h\ 17^m\ 16^s$.

December	10	−31	47	7.3

(*), $23^h\ 20^m\ 29^s$.

October	5	+66	14	40.3
	13			44.0
November	12			44.0

B. A. C. 8172, $23^h\ 21^m\ 26^s$.

December	20	−36	13	17.7

RADCLIFFE 6081, $23^h\ 21^m\ 30^s$.

November	30	+54	11	19.9

LACAILLE 9508, $23^h\ 25^m\ 30^s$.

December	12	−26	25	24.3

LACAILLE 9516, $23^h\ 26^m\ 53^s$.

December	8	−31	58	7.9
	10			10.0

LACAILLE 9534, $23^h\ 30^m\ 39^s$.

October	18	−32	33	5.0
November	27			8.0

WEISSE (2) 639, $23^h\ 31^m\ 1^s$.

1877.		°	′	″
November	3	+35	7	6.4
	6			8.7
	12			8.4

WEISSE (2) 658, $23^h\ 31^m\ 26^s$.

November	3	+35	8	5.5
	6			8.0
	12			6.2

LACAILLE 9539, $23^h\ 31^m\ 32^s$.

December	12	−25	33	25.5
	20			24.0

75 PEGASI, $23^h\ 31^m\ 47^s$.

October	13	+17	43	11.0
	16			10.2
December	7			8.8

μ SCULPTORIS, $23^h\ 34^m\ 12^s$.

November	30	−32	45	10.3

B. A. C. 8252, $23^h\ 37^m\ 9^s$.

September	25	+52	28	13.4
October	18			15.3

LACAILLE 9578, $23^h\ 37^m\ 45^s$.

December	8	−41	22	4.9

(*), $23^h\ 41^m\ 35^s$.

October	13	+63	27	40.7
November	6			41.7

O. ARG. S. 23054, $23^h\ 41^m\ 56^s$.

December	7	−28	34	44.4

LACAILLE 9605, $23^h\ 42^m\ 59^s$.

December	7	−28	32	11.5
	20			10.1

21 PISCIUM, $23^h\ 43^m\ 12^s$.

November	27	+ 0	23	36.1

108 AQUARII, $23^h\ 45^m\ 1^s$.

1877.		°	′	″
November	30	−19	35	33.6

LACAILLE 9620, $23^h\ 45^m\ 18^s$.

December	8	−35	22	32.0
	12			30.7

(*), $23^h\ 46^m\ 25^s$.

October	16	+21	3	31.9
	18			34.6

LACAILLE 9655, $23^h\ 50^m\ 13^s$.

December	31	−25	25	20.9

LACAILLE 9673, $23^h\ 52^m\ 41^s$.

December	7	−42	55	24.9

LACAILLE 9680, $23^h\ 53^m\ 28^s$.

November	27	−25	19	48.1
December	20			46.4

LACAILLE 9699, $23^h\ 55^m\ 43^s$.

December	8	−38	35	7.6

B. A. C. 8355 (1st *), $23^h\ 56^m\ 30^s$.

October	13	+65	24	51.0
	16			50.5

B. A. C. 8355 (2d *), $23^h\ 56^m\ 30^s$.

October	13	+65	24	55.2
	16			55.0

LACAILLE 9701, $23^h\ 56^m\ 45^s$.

November	6	−35	25	48.5

B. A. C. 8364, $23^h\ 58^m\ 37^s$.

October	18	+57	50	51.7
November	3			50.9

RIGHT ASCENSIONS, NORTH-POLAR DISTANCES, AND SEMI-DIAMETERS

OF THE

SUN, MOON, AND PLANETS,

DEDUCED FROM

OBSERVATIONS WITH THE TRANSIT CIRCLE

AND

COMPARED WITH THE TABLES.

1877.

RIGHT ASCENSIONS, NORTH-POLAR DISTANCES, AND SEMI-DIAMETERS

OF THE

SUN, MOON, AND PLANETS.

SUN.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1877.			h. m. s.	s.	m. s.	s.		° ′ ″	″	′ ″	″
Jan. 24	E.	.	20 29 2.88	+ 0.01	1 9.04	− 0.07	.	. . . .	. .	. .	. .
26	S.	.	20 37 22.10	− 0.09	1 8.57	− 0.31	.	108 33 4.9	+ 0.7	16 15.2	− 1.6
27	P.	.	20 41 30.59	− 0.03	1 8.67	− 0.10	.	108 17 30.4	− 1.1	15.0	− 1.7
29	F.	.	20 49 45.38	+ 0.39	1 8.34	− 0.20	.	107 45 27.4	+ 0.1	15.2	− 1.2
30	S.	.	20 53 51.08	+ 0.14	1 8.38	− 0.04	.	107 28 56.9	+ 0.4	14.7	− 1.5
31	E.	.	20 57 56.04	− 0.04	1 8.22	− 0.09	.	107 12 8.9	+ 1.7	14.8	− 1.3
Feb. 6	F.	.	21 22 10.06	+ 0.12	1 7.70	+ 0.07	.	105 25 4.3	+ 0.7	15.4	+ 0.3
7	S.	.	21 26 9.42	− 0.04	1 7.48	− 0.04	.	105 6 15.6	+ 0.3	13.6	− 1.3
8	P.	.	21 30 8.25	+ 0.04	1 7.25	− 0.16	.	104 47 12.6	+ 0.8	13.2	− 1.6
9	E.	.	21 34 6.11	− 0.06	1 7.32	+ 0.02	.	104 27 55.6	+ 2.5	14.2	− 0.4
10	F.	.	21 38 3.48	+ 0.12	1 7.14	− 0.05	.	104 8 22.2	+ 2.3	12.2	− 2.2
13	E.	.	21 49 50.16	− 0.16	1 6.90	+ 0.05	.	103 8 20.8	+ 3.1	14.3	+ 0.5
15	S.	.	21 57 37.98	+ 0.09	1 6.52	− 0.12	.	102 27 12.6	+ 0.9	13.0	− 0.4
17	E.	.	22 5 22.52	− 0.01	1 6.45	+ 0.02	.	101 45 18.2	+ 0.1	12.8	− 0.2
21	E.	.	22 20 43.39	− 0.01	1 6.07	+ 0.02	.	100 19 25.2	+ 2.7	13.9	− 1.8
28	P.	.	22 47 10.46	− 0.01	1 5.41	− 0.05	.	97 43 16.7	+ 1.0	8.1	− 3.4
Mar. 1	E.	.	22 50 55.00	+ 0.03	1 5.42	+ 0.03	.	97 20 27.5	− 0.5	12.6	+ 2.4
6	S.	.	23 9 30.60	+ 0.07	1 5.02	− 0.04	.	95 25 3.2	+ 1.0	8.3	− 0.7
15	P.	.	23 42 34.58	− 0.05	1 4.54	− 0.09	.	91 53 11.1	+ 2.4	5.2	− 1.4
30	F.	.	0 37 10.62	+ 0.15	1 4.49	+ 0.01	.	85 59 30.2	+ 0.8	1.2	− 1.3
April 3	F.	.	. . . .	. .	. . .	. .	.	84 27 12.4	+ 1.2	1.4	0.0
7	F.	.	1 6 20.08	+ 0.10	1 4.64	− 0.03	.	82 56 25.3	+ 1.3	0.1	− 0.1
11	F.	.	1 21 0.00	− 0.04	1 4.81	− 0.01	.	81 27 31.0	+ 1.3	15 59.2	+ 0.1
12	S.	.	1 24 40.82	+ 0 03	1 4.77	− 0.10	.	81 5 37.1	+ 0.5	58.6	− 0.2
24	S.	.	2 9 17.96	− 0.01	1 5.48	− 0.10	.	76 56 11.2	− 0.9	55.7	− 0.1
May 4	E.	.	2 47 19.52	− 0.04	1 6.28	− 0.07	.	73 51 35.5	+ 2.3	52.8	− 0.6
7	P.	.	2 58 54.84	− 0.07	1 6.44	− 0.15	.	73 1 7.5	+ 1.5	51.0	− 1.7
10	S.	.	3 10 35.44	− 0.12	1 6.74	− 0.09	.	72 13 13.0	+ 2.5	50.9	− 0.1
11	S.	I	3 14 30.33	+ 0.04	. .	. .	S.	71 57 46.3	− 0.9	. .	. .
15	P.	.	3 30 14.86	− 0.08	1 7.10	− 0.14	.	70 59 20.4	+ 1.6	50.0	− 1.0
18	S.	.	3 42 9.34	− 0.01	1 7.38	− 0.10	.	70 18 51.1	+ 2.1	49.3	− 1.1
28	E.	.	. . . .	. .	. .	. .	.	68 26 16.2	+ 1.9	48.1	− 0.7
June 1	E.	.	4 38 43.86	+ 0.10	1 8.37	− 0.07	.	67 51 27.9	+ 2.3	47.9	− 0.3
8	P.	.	5 7 32.64	− 0.13	1 8.58	− 0.19	.	67 5 26.1	+ 1.1	44.8	− 2.6
13	E.	I	5 28 16.24	− 0.07	. .	. .	N.	66 44 37.4	+ 2.7	. .	. .
19	S.	.	5 53 12.86	− 0.15	1 9.14	+ 0.17	.	66 33 8.9	+ 2.2	45.4	− 1.1
20	P.	.	5 57 22.52	− 0.05	1 8.88	− 0.09	.	66 32 39.9	+ 1.2	44.4	− 2.0
23	S.	.	6 9 51.10	+ 0.09	1 8.94	− 0.02	.	66 33 46.5	+ 3.0	45.9	− 0.4
26	F.	II	6 22 18.62	+ 0.01	. .	. .	.	66 38 31.7	+ 1.0	45.4	− 0.8
July 7	E.	.	7 7 44.20	− 0.12	1 8.52	+ 0.03	.	67 27 24.4	+ 3.1	45.9	− 0.3
12	F.	.	7 28 10.13	+ 0.04	1 8.16	− 0.04	.	68 5 22.8	+ 1.1	46.6	+ 0.3
13	S.	.	7 32 13.94	+ 0.05	1 8.08	− 0.05	.	68 14 8.9	+ 2.7	45.3	− 1.3
28	F.	.	8 32 5.42	+ 0.07	1 6.94	− 0.01	.	71 7 40.7	+ 1.1	47.0	− 0.6
30	P.	.	8 39 54.20	− 0.10	1 6.66	− 0.12	.	71 36 26.0	+ 2.1	46.4	− 1.5
Aug. 10	S.	.	9 22 11.74	+ 0.15	1 5.74	− 0.08	.	74 35 10.8	+ 5.4	47.5	− 1.9
Oct. 5	S.	.	12 46 8.74	+ 0.05	1 4.51	− 0.07	.	94 57 36.8	+ 1.2	16 2.0	− 0.7
13	S.	.	13 15 34.42	+ 0.06	1 5.06	− 0.08	.	97 59 53.8	− 0.3	5.0	0.0

SUN.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr' Am. E
1877.			h. m. s.	s.	m. s.	s.		° ' "	"	' "	
Nov. 1	P.	.	14 27 58.48	− 0.07	1 6.96	− 0.05	.	104 38 0.9	− 0.6	8.4	− 1
3	F.	.	14 35 51.59	+ 0.02	1 7.30	+ 0.05	.	105 15 47.1	0.0	10.4	− 0
7	F.	.	14 51 47.91	+ 0.28	1 7.70	− 0.03	.	. . . .	. .	. .	.
12	E.	.	15 12 1.65	+ 0.10	1 8.28	− 0.05	.	107 52 29.2	+ 0.1	11.9	− 0
13	P.	.	15 16 6.98	+ 0.13	1 8.46	+ 0.01	.	108 8 21.0	− 4.5	11.2	− 1
16	E.	.	15 28 27.81	+ 0.12	1 8.74	− 0.05	.	108 54 20.4	+ 2.2	12.4	− 1
20	E.	.	15 45 6.90	− 0.13	1 9.34	+ 0.09	.	109 50 43.7	+ 0.5	14.6	+ 0
Dec. 3	P.	.	16 40 40.44	− 0.05	1 10.36	− 0.16	.	112 12 17.1	− 1.1	14.8	− 1
14	E.	II	17 28 59.61	− 0.10	. . .	. .	.	113 15 57.2	+ 0.9	17.5	− 0
15	F.	.	17 33 25.56	+ 0.16	1 11.18	− 0.02	.	113 18 56.4	− 2.5	17.2	− 0
18	E.	.	17 46 42.69	+ 0.04	1 10.28	+ 0.01	.	113 25 18.3	− 0.7	18.3	+ 0

MOON.

Date.	Mean Time of Transit of Center.	Observer.	Limb.	Apparent Right Ascension of Center.	Corrections to Tables of—		Limb.	Geocentric N. P. Distance of Center.	Corrections to Tables of—	
					Peirce.	Hansen.			Peirce.	Hansen.
1877.	h. m. s.			h. m. s.	s.	s.		° ′ ″	s.	s.
Jan. 24	7 50 57.9	E.	I	4 8 44.36	+ 0.09	− 0.41	.	. . . .	. .	. .
25	8 53 37.6	F.	I	5 15 30.97	− 0.15	− 0.58	N.	61 47 30.0	+ 0.5	+ 0.8
26	9 59 40.3	S.	I	6 25 41.10	− 0.16	− 0.38	N.	61 56 39.6	− 1.8	− 1.5
27	11 5 38.9	P.	I, II	7 35 47.04	− 0.90	− 1.05	N.	64 21 38.6	− 1.6	− 2.2
28	12 8 24.9	E.	I, II	8 42 39.92	− 0.57	− 0.85	N.	68 48 30.2	+ 0.6	− 2.4
30	13 59 46.9	S.	II	10 42 13.30	− 0.10	− 0.68	S.	81 35 30.1	+ 2.0	− 6.6
Feb. 7	20 35 31.1	S.	II	17 50 35.00	− 0.01	− 0.66	.	. . . .	. .	. .
17	3 14 22.1	E.	I	1 6 0.55	− 0.13	− 0.14	S.	79 23 29.4	− 1.0	+ 2.0
20	5 40 54.3	P.	I	3 44 46.44	+ 0.27	− 0.19	S.	64 50 48.6	+ 1.6	+ 3.1
21	6 39 17.7	E.	I	4 47 16.00	+ 0.37	− 0.41	S.	62 16 18.9	− 1.2	− 0.9
25	10 47 20.7	E.	I	9 11 45.97	− 0.48	− 0.60	N.	71 22 20.7	− 2.6	− 4.9
27	12 34 32.0	S.	II	11 7 8.03	− 0.46	− 0.64	S.	84 51 44.8	+ 1.3	− 4.3
Mar. 20	4 33 6.1	F.	I	4 27 10.66	+ 0.10	− 0.33	S.	62 56 10.4	+ 0.7	− 0.1
23	7 35 50.4	S.	I	7 42 14.63	+ 0.07	− 0.36	N.	64 41 25.1	+ 5.3	+ 1.0
29	12 48 33.9	E.	II	13 19 28.83	− 0.12	− 0.52	S.	102 12 2.3	+ 1.4	− 4.1
30	13 38 43.8	F.	II	14 13 43.46	− 0.16	− 0.62	S.	108 5 4.5	+ 9.7	+ 4.7
April 20	6 28 14.1	S.	I	8 24 50.73	− 0.38	− 0.44	N.	67 35 12.2	+ 3.0	− 0.6
21	7 22 54.6	P.	I	9 23 36.74	− 0.54	− 0.54	N.	72 43 14.8	− 0.1	− 2.6
22	8 14.20	E.	.	. . . .	. .	. .	N.	78 51 51.8	+ 2.3	− 0.2
23	9 2 59.9	F.	I	11 11 51.59	− 0.38	− 0.71	N.	85 35 53.0	0.0	− 3.7
25	10 38 18.8	P.	I	12 55 19.28	+ 0.12	− 0.47	N.	99 15 43.0	+ 3.6	− 2.0
May 2	16 45 54.8	S.	II	19 31 31.52	− 0.39	− 0.49	N.	115 35 39.8	+ 2.9	+ 3.6
3	17 33 59.6	P.	II	20 23 40.79	− 0.53	− 0.58	N.	112 23 7.9	+ 3.3	+ 3.2
6	19 42 20.8	S.	II	22 44 12.78	− 0.47	− 0.49	N.	97 53 12.6	+ 7.2	+ 5.3
9	21 46 28.1	S.	II	1 0 30.12	− 0.37	− 0.70	.	. . . .	. .	. .
18	5 19 23.3	S.	I	9 6 12.15	− 0.40	− 0.61	N.	71 17 29.2	+ 3.9	+ 0.4
23	9 20 53.7	P.	I	13 28 5.02	0.00	− 0.55	N.	103 17 55.0	+ 2.6	− 3.5
24	10 9 58.6	E.	I	14 21 14.52	− 0 08	− 0.66	N.	108 47 25.5	+ 2.7	− 3.1
28	13 44 35.9	E.	II	18 12 13.35	− 0.36	− 0.35	S.	117 53 42.9	+ 4.3	+ 3.2
31	16 13 8.7	P.	II	20 53 0.25	− 0.52	− 0.57	N.	109 46 12.3	+ 3.7	+ 4.5
June 19	7 18 35.8	S.	I	13 11 55.17	− 0.13	− 0.49	N.	101 38 35.2	+ 3.2	− 1.4
20	8 6 27.8	P.	I	14 3 50.49	− 0.15	− 0.57	N.	107 17 49.0	+ 1.4	− 3.9
22	9 48 33.3	F.	I	15 54 5.92	− 0.29	− 0.75	N.	115 28 52.7	+ 3.4	− 1.6
23	10 42 28.4	S.	I	16 52 6.47	− 0.19	− 0.58	S.	117 32 11.3	+ 2.0	− 1.9
25	12 30 2.9	P.	I, II	18 47 51.72	− 0.26	− 0.41	S.	117 2 44.7	+ 3.4	+ 2.0
29	15 34 19.2	F.	II	22 8 24.50	− 0.33	− 0.49	N.	101 45 15.8	+ 0.7	+ 2.7
July 1	16 53 44.7	S.	II	23 35 56.21	− 0.30	− 0.41	N.	90 33 13.7	+ 6.5	+ 7.7
15	4 28 28.4	E.	I	12 3 49.30	− 0.59	− 0.59	N.	93 15 1.8	+ 1.3	− 2.3
26	13 32 31.0	P.	II	21 52 43.36	− 0.52	− 0.62	N.	103 27 44.8	+ 2.5	+ 4.4
29	15 31 35.1	S.	II	0 3 56.76	− 0.40	− 0.56	N.	86 39 13.1	+ 2.8	+ 5.9
30	16 11 56.9	P.	II	0 48 21.74	− 0.32	− 0.51	N.	80 54 35.7	+ 2.6	+ 5.4
Aug. 3	19 28 8.3	P.	II	4 20 51.62	− 0.12	− 0.57	N.	63 11 29.7	+ 4.6	+ 4.6
17	7 27 33.8	S.	I	17 13 30.50	− 0.28	− 0.53	N.	118 4 22.9	+ 2.0	+ 1.0
18	8 21 9.1	F.	I	18 11 11.15	− 0.51	− 0.59	S.	117 58 39.6	+ 2.4	+ 1.2
21	10 48 7.8	E.	I	20 50 23.71	− 0.48	− 0.42	S.	109 46 39.8	+ 4.1	+ 3.8
Sept. 18	9 29 37.6	F.	I	21 22 4.03	− 0.53	− 0.36	S.	106 44 59.2	+ 2.0	+ 1.1
Oct. 12	4 59.75	F.	.	. . . .	. .	. .	S.	117 31 18.8	− 0.5	+ 1.8
13	5 51 57.3	S.	I	19 22 21.85	− 0.45	− 0.36	S.	115 34 36.2	+ 2.2	+ 3.5
14	6 40 39.9	P.	I	20 15 8.99	− 0.39	− 0.22	S.	112 25 22.2	+ 0.6	+ 1.1
15	7 25 58.3	E.	I	21 4 31.37	− 0.57	− 0.36	S.	108 19 17.9	+ 3.2	+ 2.6
16	8 8 29.2	F.	I	21 51 5.85	− 0.56	− 0.36	S.	103 30 18.5	+ 4.0	+ 2.4
18	9 28.78	P.	.	. . . .	. .	. .	S.	92 30 48.6	+ 3.4	+ 1.9
22	12 19 35.7	F.	II	2 26 32.89	− 0.45	− 0.57	N.	70 25 50.0	− 4.2	− 2.3
23	13 10 11.4	E.	II	3 21 13.53	− 0.40	− 0.59	N.	66 19 43.8	+ 1.2	+ 2.5
24	14 4 51.9	P.	II	4 19 59.56	− 0.28	− 0.63	N.	63 27 9.1	+ 2.0	+ 3.1
Nov. 11	5 19 49.3	P.	I	20 44 28.69	− 0.53	− 0.27	S.	109 51 0.8	+ 2.4	+ 2.6
12	6 3 36.6	E.	I	21 32 19.70	− 0.62	− 0.34	S.	105 16 48.3	+ 4.6	+ 3.7
13	6 44 52.9	F.	I	22 17 39.36	− 0.54	− 0.26	S.	100 8 54.0	+ 6.1	+ 3.8
16	8 44 30.0	E.	I	0 29 25.75	− 0.58	− 0.40	S.	83 9 29.5	+ 5.4	+ 2.3
17	9 26 51.2	F.	I	1 15 50.46	− 0.46	− 0.38	S.	77 32 48.8	+ 6.1	+ 4.2
19	11 2 2.1	P.	I	2 59 10.16	− 0.31	− 0.45	N.	67 50 29.6	+ 2.6	+ 2.1
20	11 56 14.1	E.	I, II	3 57 27.65	− 0.38	− 0.56	S.	64 26 45.7	+ 1.0	+ 0.4
27	18 27 50.8	P.	II	10 57 44.50	+ 0.33	− 0.79	S.	85 1 20.3	+ 3.5	− 4.9
Dec. 8	3 11 48.5	F.	I	20 22 33.91	− 0.19	− 0.06	S.	111 21 45.9	+ 1.7	+ 1.9
9	3 57 19.9	P.	I	21 12 9.34	− 0.39	− 0.22	S.	107 2 29.1	+ 1.9	+ 1.5
10	4 39 43.6	E.	I	21 58 36.60	− 0.46	− 0.25	S.	102 5 16.2	+ 4.3	+ 3.1
14	7 19 28.2	E.	I	0 54 33.61	− 0.60	− 0.29	S.	79 48 16.3	+ 6.1	+ 2.0
15	8 2.98	F.	.	. . . .	. .	. .	S.	74 28 17.3	+ 4.8	+ 0.8
18	10 39 27.6	E.	I	4 30 52.13	− 0.45	− 0.61	N.	63 10 56.2	+ 3.2	+ 2.3
19	11 40 16.4	F.	I	5 35 47.53	− 0.37	− 0.69	N.	62 16 47.0	+ 0	− 0.4

MERCURY.

Date.	Observer.	Part observed.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Part observed.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n Am. E
1877.			h. m. s.	s.	s.	″		° ′ ″	s.	″	′
Feb. 12	E.	II	20 7 0.16	+ 0.27	. .	. .	C	108 49 28.2	− 0.1	. .	.
16	E.	II	20 19 27.56	+ 0.35	. .	. .	C	108 57 11.7	+ 0.7	. .	.
28	E.	II	21 15 5.61	+ 0.32	. .	. .	C	107 13 29.1	+ 0.2	. .	.
Mar. 5	S.	C	21 42 45.83	+ 0.24	. .	. .	C	105 33 57.5	− 1.1	. .	.
14	P.	II	22 36 10.56	+ 0.24	. .	. .	C	101 13 32.9	+ 0.5	. .	.
April 12	S.	I	1 50 34.19	− 0.05	. .	. .	C	78 26 23.2	+ 3.8	. .	.
24	S.	II	3 18 55.63	− 0.40	. .	. .	C	69 27 32.9	+ 3.4	. .	.
May 4	E.	I	4 11 6.84	− 0.27	. .	. .	S	66 15 36.9	+ 3.1	. .	.
June 18	S.	II	4 19 35.65	− 0.14	. .	. .	.	72 10 54.6	+ 2.9	2.4	− 1.
22	S.	II	4 35 28.08	− 0.07	. .	. .	C	70 59 4.9	+ 2.7	. .	.
July 30	P.	.	9 27 5.80	− 0.10	0.17	− 0.01	.	73 12 38.2	+ 0.3	2.1	− 0.
Oct. 4	S.	II	11 52 11.79	+ 0.26	. .	. .	S	88 51 28.2	+ 3.5	. .	.
12	S.	II	12 11 58.05	+ 0.27	. .	. .	S	89 19 49.6	+ 1.9	. .	.
31	P.	C	14 0 37.55	+ 0.20	. .	. .	C	101 4 17.2	+ 2.3	. .	.
Dec. 3	P.	C	17 27 52.35	+ 0.11	. .	. .	C	115 15 6.9	− 1.2	. .	.
14	E.	C	18 42 2.71	+ 0.17	. .	. .	C	115 22 31.6	+ 1.3	. .	.

VENUS.

Date.	Observer.	Part obs'd.	Apparent Right Ascension of Center.	Correction to—		Sid. Time of Transit of Semi-diam.	Corr'n to Am. Eph.	Part obs'd.	Geocentric N. P. Distance of Center.	Corrections to—		Vertical Semi-diameter.	Corr'n to Am. Eph.
				Am. Eph.	Le Verrier's Tables.					Am. Eph.	Le Verrier's Tables.		
1877.			h. m. s.	s.	s.	s.	s.		° ′ ″	″	″	″	″
Jan. 24	F.	II	18 46 36.81	+ 0.21	+ 0.19	. .	. .	.	112 44 10.0	+ 4.0	+ 3.9	7.3	+ 1.5
26	P.	II	18 57 24.33	+ 0.25	+ 0.23	. .	. .	N.	112 36 14.4	+ 0.4	+ 0.3	5.9	+ 0.1
28	F.	II	19 8 10.28	+ 0.08	+ 0.06	. .	. .	.	112 25 36.5	− 0.4	− 3.5	7.5	+ 1.8
29	S.	.	19 13 32.73	+ 0.11	+ 0.09	0.40	− 0.01	.	112 19 18.9	+ 2.2	+ 2.2	5.8	+ 0.1
30	E.	II	19 18 54.61	+ 0.08	+ 0.07	. .	. .	.	112 12 18.5	+ 2.4	+ 2.5	5.1	− 0.6
Feb. 5	F.	II	19 50 53.24	+ 0.28	+ 0.27	. .	. .	.	111 16 14.6	+ 0.6	+ 0.6	6.2	+ 0.6
6	S.	.	19 56 10.08	− 0.02	− 0.03	0.46	+ 0.06	.	111 4 39.9	+ 2.4	+ 2.4	5.4	− 0.2
7	P.	II	20 1 26.51	+ 0.14	+ 0.14	. .	. .	C.	110 52 25.7	+ 2.7	+ 2.7	. .	. .
9	F.	.	20 11 56.36	+ 0.16	+ 0.16	. .	. .	.	110 26 0.7	− 1.8	− 1.5	6.0	+ 0.5
12	E.	II	20 27 33.88	+ 0.20	+ 0.19	. .	. .	.	109 42 4.4	+ 3.4	+ 3.6	7.0	+ 1.5
14	S.	.	20 37 53.51	+ 0.05	+ 0.04	0.37	− 0.01	.	109 9 47.8	+ 1.9	+ 2.0	6.1	+ 0.6
15	P.	.	20 43 1.93	+ 0.20	+ 0.19	0.39	+ 0.01	.	108 52 50.9	+ 2.9	+ 3.0	4.8	− 0.7
16	E.	II	20 48 9.08	+ 0.19	+ 0.18	. .	. .	.	108 35 21.1	+ 5.6	+ 3.9	3.4	− 2.0
20	E.	II	21 8 20.40	+ 0.17	+ 0.15	. .	. .	.	107 20 2.9	+ 2.1	+ 2.2	5.7	+ 0.3
27	P.	.	21 43 12.62	+ 0.09	+ 0.08	0.35	− 0.02	.	104 49 51.1	+ 1.2	+ 1.3	5.4	+ 0.1
28	P.	II	21 48 6.26	+ 0.19	+ 0.17	. .	. .	.	104 26 40.3	+ 1.6	+ 1.6	6.0	+ 0.7
Mar. 5	S.	II	22 12 18.05	+ 0.16	+ 0.16	. .	. .	.	102 25 1.0	+ 1.9	+ 2.1	6.6	+ 1.3
14	P.	.	22 54 50.96	+ 0.11	+ 0.09	0.43	+ 0.08	C.	98 25 51.0	+ 2.9	+ 2.9	. .	. .
April 11	S.	II	1 2 49.96	− 0.09	− 0.14	. .	. .	.	84 44 29.3	+ 1.4	+ 1.5	4.2	− 0.8
23	S.	II	1 58 14.10	− 0.03	− 0.11	. .	. .	.	79 3 34.2	+ 1.7	+ 2.0	3.9	− 1.1
June 13	E.	I	6 12 42.48	− 0.18	− 0.33	. .	. .	.	65 49 2.9	+ 1.3	+ 1.4	5.4	+ 0.4
19	S.	.	6 45 0.22	− 0.02	− 0.17	0.37	0.00	.	65 58 59.8	+ 3.1	+ 3.0	5.4	+ 0.3
20	P.	I	6 50 22.32	+ 0.08	− 0.06	. .	. .	.	66 3 7.7	+ 1.5	+ 1.4	4.9	− 0.2
23	S.	.	7 6 25.47	+ 0.01	− 0.11	0.42	+ 0.05	.	66 19 52.4	+ 3.1	+ 3.0	6.4	+ 1.3
July 30	P.	.	10 12 22.54	− 0.02	− 0.13	0.37	− 0.01	.	77 16 29.2	+ 1.4	+ 1.0	5.7	+ 0.1
Aug. 10	S.	I	11 2 42.33	+ 0.03	− 0.09	. .	. .	.	82 25 31.1	+ 5.8	+ 5.3	5.9	+ 0.1
Sept. 10	F.	.	. . . .	. .	. .	. .	. .	N.	98 13 53.5	− 3.3	− 3.7	. .	. .
Oct. 5	S.	I	15 14 28.24	− 0.02	− 0.08	. .	. .	.	109 18 50.7	+ 3.6	+ 3.5	8.0	+ 0.6
13	S.	I	15 53 26.00	− 0.14	− 0.21	. .	. .	N.	111 58 48.5	+ 0.5	+ 0.3	. .	. .
Nov. 1	P.	I	17 29 29.07	+ 0.25	+ 0.24	. .	. .	.	111 46 44.3	+ 1.4	+ 1.5	7.7	− 1.2
3	F.	I	17 43 43.61	− 0.04	− 0.05	. .	. .	.	115 56 43.3	+ 4.4	+ 4.4	9.9	+ 0.9
7	F.	I	18 0 11.48	− 0.07	− 0.10	. .	. .	.	116 8 2.4	+ 0.4	+ 0.3	9.8	+ 0.5
12	E.	I	18 25 36.32	+ 0.04	0.00	. .	. .	.	116 6 21.5	+ 1.5	+ 1.6	10.3	+ 0.6
13	F.	I	18 30 39.00	− 0.03	− 0.05	. .	. .	.	116 3 55.3	+ 2.3	+ 2.4	11.2	+ 1.5
19	P.	I	19 0 32.96	0.00	+ 0.01	. .	. .	.	115 34 46.1	+ 0.4	+ 0.2	9.4	− 0.8
20	E.	I	19 5 27.41	− 0.04	− 0.02	. .	. .	.	115 27 34.6	+ 1.0	+ 0.8	10.0	− 0.3
Dec. 3	P.	I	20 6 35.51	+ 0.10	+ 0.13	. .	. .	.	112 57 49.5	+ 0.7	+ 0.2	12.0	+ 0.3
8	F.	I	20 28 29.08	+ 0.16	+ 0.16	. .	. .	.	111 35 34.5	+ 0.8	+ 0.3	12.7	+ 0.4
9	P.	I	20 32 43.91	− 0.06	− 0.05	. .	. .	.	111 17 43.9	+ 1.2	+ 0.7	12.8	+ 0.3
14	E.	I	20 53 17.40	− 0.19	− 0.16	. .	. .	S.	109 42 20.6	+ 3.0	+ 2.1	. .	. .
15	F.	I	20 57 15.50	− 0.08	− 0.04	. .	. .	.	109 22 5.4	+ 0.2	− 0.6	13.7	+ 0.3
18	E.	I	21 8 50.91	− 0.08	− 0.07	. .	. .	S.	108 19 30.6	− 0.1	− 0.5	. .	. .

MARS.

Date.		Observer.	Part observed.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Part observed.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1877.				h. m. s.	s.	s.	"		° ′ "	"	"	"
July	29	S.	.	23 26 56.98	− 0.80	0.80	+ 0.04	C	99 45 12.3	+ 6.2	. .	. .
	30	P.	.	23 27 20.24	− 0.73	0.81	+ 0.05	C	99 45 49.3	+ 6.1	. .	. .
Aug.	6	S.	.	. . . .	. .	. .	. .	C	99 57 30.7	+ 6.3	. .	. .
	18	F.	.	. . . .	. .	. .	. .	C	100 43 13.2	+ 4.4	. .	. .
	21	E.	.	23 22 48.72	− 0.88	0.93	+ 0.04	C	100 58 0.0	+ 3.6	. .	. .
	27	S.	.	23 17 45.14	− 0.92	0.94	+ 0.03	C	101 29 7.4	+ 5.5	. .	. .
	28	E.	.	23 16 47.84	− 0.95	0.94	+ 0.03	C	101 34 18.3	+ 5.5	. .	. .
Sept.	1	F.	.	23 12 44.79	− 0.89	0.96	+ 0.04	C	101 54 26.1	+ 7.0	. .	. .
	3	F.	.	23 10 37.19	− 0.91	0.95	+ 0.03	C	102 3 51.7	+ 7.0	. .	. .
	15	F.	.	. . . .	. .	. .	. .	C	102 43 0.0	+ 5.3	. .	. .
	21	F.	.	22 52 54.54	− 0.79	0.92	+ 0.05	C	102 47 8.9	+ 4.8	. .	. .
	22	F.	.	22 52 10.90	− 0.83	0.86	0.00	.	. . . .	. .	. .	. .
	24	F.	.	22 50 51.21	− 0.74	0.87	+ 0.02	C	102 44 53.2	+ 4.5	. .	. .
	26	P.	.	22 49 41.74	− 0.75	0.81	− 0.02	C	102 41 47.4	+ 5.7	. .	. .
Oct.	1	F.	.	22 47 36.84	− 0.66	0.86	+ 0.07	C	102 28 27.7	+ 6.2	. .	. .
	2	P.	I	22 47 20.48	− 0.72	. .	. .	C	102 24 51.2	+ 5.4	. .	. .
	6	F.	.	22 46 45.16	− 0.82	0.83	+ 0.08	C	102 7 27.0	+ 4.8	. .	. .
	9	P.	.	. . . .	. .	. .	. .	C	101 51 19.6	+ 4.4	. .	. .
	12	F.	.	22 47 23.11	− 0.59	0.85	+ 0.14	C	101 32 44.0	+ 3.8	. .	. .
	14	P.	.	22 47 59.43	− 0.55	0.74	+ 0.04	C	101 19 2.3	+ 3.8	. .	. .
	15	E.	.	22 48 21.96	− 0.45	0.76	+ 0.07	C	101 11 49.7	+ 4.5	. .	. .
	17	S.	.	. . . .	. .	. .	. .	C	100 56 40.5	+ 4.5	. .	. .
	18	P.	.	22 49 45.84	− 0.49	0.71	+ 0.04	C	100 48 46.1	+ 5.3	. .	. .
	23	E.	.	22 52 57.93	− 0.51	0.74	+ 0.11	.	100 5 58.8	+ 4.7	10.4	+ 1.1
	24	P.	.	22 53 43.80	− 0.44	0.63	+ 0.01	.	99 56 50.1	+ 5.5	9.4	+ 0.3
	31	E.	.	23 0 7.23	− 0.47	0.58	+ 0.01	.	98 47 37.5	+ 4.4	8.9	+ 0.5
Nov.	2	S.	.	23 2 15.76	− 0.45	0.74	+ 0.18	.	98 26 20.7	+ 4.9	9.7	+ 1.4
	12	E.	.	23 14 48.92	− 0.14	0.66	+ 0.16	.	96 30 56.5	+ 3.9	8.1	+ 0.7
	13	F.	I	23 16 13.11	− 0.31	. .	. .	N.	96 18 40.4	+ 4.1	. .	. .
	16	E.	I	23 20 34.90	− 0.27	. .	. .	.	95 41 9.0	+ 3.1	7.9	+ 0.8
	19	P.	.	23 25 8.89	− 0.20	0.51	+ 0.05	.	95 2 41.7	+ 3.2	7.3	+ 0.4
Dec.	3	P.	.	23 48 41.80	− 0.20	0.43	+ 0.03	.	91 52 52.2	+ 4.7	6.4	+ 0.4
						JUPITER.						
May	15	P.	.	18 11 11.86	+ 0.99	1.60	− 0.04	.	113 4 28.4	− 5.1	21.2	+ 0.1
	18	S.	.	18 10 8.25	+ 1.05	1.66	+ 0.01	.	113 4 59.6	− 5.5	21.4	− 0.3
	28	E.	.	18 5 57.35	+ 1.12	1.78	+ 0.10	.	113 6 46.6	− 2.9	21.8	+ 1.4
June	19	S.	.	17 54 26.56	+ 1.22	1.76	+ 0.05	.	113 9 24.7	− 5.4	22.2	+ 1.2
	22	F.	.	17 52 46.72	+ 1.09	1.80	+ 0.09	.	113 9 34.6	− 4.9	22.2	+ 1.0
	23	S.	.	17 52 13.69	+ 1.17	1.74	+ 0.03	.	113 9 37.2	− 4.6	22.2	+ 1.0
	25	P.	.	17 51 7.75	+ 1.15	1.72	+ 0.01	.	113 9 40.9	− 4.7	22.2	+ 0.2
	28	P.	.	17 49 29.81	+ 1.09	1.74	+ 0.04	.	113 9 44.2	− 4.6	22.2	+ 0.3
	29	F.	.	17 48 57.62	+ 1.14	1.77	+ 0.07	.	113 9 44.4	− 4.9	22.2	+ 1.2
July	7	E.	.	17 44 49.28	+ 0.94	1.86	+ 0.17	.	113 9 39.2	− 3.9	22.0	+ 0.6
	8	F.	I	17 44 20.03	+ 1.16	. .	. .	.	113 9 37.6	− 3.9	22.0	+ 0.2
	16	F.	.	17 40 40.95	+ 1.21	1.72	+ 0.04	.	113 9 19.6	− 5.0	21.7	− 1.0
	26	P.	.	17 36 58.14	+ 1.21	1.64	− 0.01	.	113 9 2.9	− 3.6	21.3	0.0
Aug.	17	S.	.	17 33 0.14	+ 1.19	1.56	+ 0.01	.	113 10 5.5	− 3.9	20.2	+ 0.7
	18	F.	.	. . . .	. .	. .	. .	.	113 10 12.0	− 5.3	20.1	+ 0.2

SATURN

Date.	Observer.	Part observed.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Part observed.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1877.			h. m. s.	s.	s.	"		° ' "	"	"	"
Aug. 18	F.	.	23 21 16.82	− 1.36	0.70	+ 0.06	.	96 35 24.2	+ 21.6	8.9	0.0
Sept. 3	F.	.	23 17 1.75	− 1.36	0.65	0.00	.	97 4 23.6	+ 23.6	9.0	0.0
15	F.	.	. . . .	. .	. .	. .	.	97 26 25.8	+ 25.5	7.9	− 1.1
Oct. 23	E.	.	23 4 52.44	− 1.63	0.70	+ 0.07	.	98 18 48.5	+ 25.5	9.8	+ 1.1
24	P.	.	23 4 43.51	− 1.65	0.62	− 0.01	.	98 19 36.1	+ 26.3	8.3	− 0.4
31	E.	.	23 3 50.59	− 1.72	0.70	+ 0.07	.	98 23 59.2	+ 25.8	9.5	+ 0.8
Nov. 3	F.	.	23 3 33.18	− 1.82	0.65	+ 0.03	.	98 25 15.0	+ 24.0	8.9	+ 0.3
12	E.	.	23 3 1.72	− 1.72	0.78	+ 0.16	.	98 26 56.1	+ 25.2	10.0	+ 1.5
13	F.	.	23 3 0.10	− 1.76	0.68	+ 0.07	.	98 26 54.4	+ 24.8	8.8	+ 0.3
16	E.	.	23 2 57.67	− 1.80	0.63	+ 0.02	.	98 26 33.3	+ 22.8	8.6	+ 0.2
19	P.	.	23 2 58.92	− 1.69	0.62	+ 0.01	.	98 25 53.0	+ 23.8	8.2	− 0.2
20	E.	.	23 3 0.06	− 1.72	0.69	+ 0.08	.	98 25 35.1	+ 24.6	9.4	+ 1.0

URANUS.

Date.	Observer.	Part observed.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Part observed.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
Jan. 26	S.	.	9 43 41.16	+ 0.15	. .	. .	.	75 31 40.3	+ 1.5	. .	. .
27	P.	.	9 43 31.38	+ 0.08	. .	. .	.	75 30 50.0	+ 1.5	. .	. .
30	S.	.	9 43 1.90	+ 0.16	. .	. .	.	75 28 17.5	+ 1.4	. .	. .
Feb. 3	S.	.	9 42 21.72	+ 0.11	. .	. .	.	75 24 49.6	− 0.7	. .	. .
6	F.	.	9 41 51.32	+ 0.18	. .	. .	.	. . . .	. .	. .	. .
13	E.	.	9 40 39.48	+ 0.10	0.18	+ 0.05	.	75 16 14.1	+ 2.1	. .	. .
15	S.	.	9 40 19.04	+ 0.12	. .	. .	.	75 14 28.9	− 0.3	. .	. .
17	E.	.	9 39 58.68	+ 0.15	. .	. .	.	75 12 48.2	+ 1.2	. .	. .
19	S.	.	9 39 38.36	+ 0.12	. .	. .	.	75 11 7.1	+ 1.1	. .	. .
21	E.	.	9 39 18.26	+ 0.14	0.20	+ 0.07	.	75 9 28.4	+ 2.4	1.0	− 0.9
25	E.	.	. . . .	. .	. .	. .	.	75 6 11.3	+ 1.2	. .	. .
27	S.	.	9 38 19.23	+ 0.13	. .	. .	.	75 4 36.7	+ 2 2	. .	. .
Mar. 9	E.	.	9 36 47.14	+ 0.14	0.20	+ 0.07	.	74 57 8.3	+ 2.1	. .	. .
23	S.	.	9 34 57.92	+ 0.13	. .	. .	.	74 48 27.8	+ 0.7	. .	. .
29	E.	.	9 34 20.28	+ 0.16	0.18	+ 0.05	.	74 45 34.1	+ 1.3	. .	. .
April 5	P.	.	9 33 44.30	+ 0.17	. .	. .	.	74 42 51.7	+ 1.5	. .	. .
6	E.	.	9 33 39.88	+ 0.15	0.16	+ 0.03	.	74 42 33.4	+ 2.7	. .	. .
7	F.	.	9 33 35.65	+ 0.12	. .	. .	.	74 42 14.3	+ 2.1	. .	. .
11	F.	.	9 33 20.75	+ 0.08	. .	. .	.	74 41 11.3	+ 3.4	. .	. .
12	S.	.	9 33 17.59	+ 0.14	. .	. .	.	74 40 56.3	+ 2.0	. .	. .
21	P.	.	9 32 57.68	+ 0.06	. .	. .	.	74 39 39.6	+ 2.1	. .	. .
Nov. 27	P.	.	10 7 22.71	+ 0.11	. .	. .	.	77 37 59.5	+ 1.0	. .	. .

NEPTUNE.

Date.	Observer.	Part observed.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Part observed.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
Oct. 18	P.	.	2 18 53.36	+ 0.10	. .	. .	.	78 3 38.9	+ 0.8	. .	. .
22	F.	.	2 18 27.87	+ 0.17	. .	. .	.	78 5 49.1	− 1.5	. .	. .
23	E.	.	2 18 21.38	+ 0.12	. .	. .	.	78 6 24.5	+ 0.7	. .	. .
24	P.	.	2 18 14.87	+ 0.07	. .	. .	.	78 6 56.4	− 0.7	. .	. .
Nov. 2	S.	.	2 17 16.61	+ 0.17	. .	. .	.	78 11 54.9	− 0.3	. .	. .
3	F.	.	2 17 10.16	+ 0.19	. .	. .	.	78 12 28.7	+ 0.8	. .	. .
12	E.	.	2 16 12.75	+ 0.04	. .	. .	.	78 17 13.4	− 1.2	. .	. .
13	F.	.	2 16 6.61	+ 0.11	. .	. .	.	78 17 45.1	− 0.3	. .	. .
16	E.	.	2 15 48.25	+ 0.14	. .	. .	.	78 19 16.0	− 0.1	. .	. .
19	P.	.	2 15 30.30	+ 0.16	. .	. .	.	78 20 43.7	− 0.6	. .	. .
20	E.	.	2 15 24.49	+ 0.23	. .	. .	.	78 21 12.4	− 0.6	. .	. .
Dec. 8	F.	.	2 13 50.31	+ 0.12	. .	. .	.	78 28 38.7	− 0.4	. .	. .
10	E.	.	2 13 41.69	+ 0.26	. .	. .	.	78 29 18.5	− 0.4	. .	. .
11	F.	.	2 13 37.29	+ 0.10	. .	. .	.	78 29 38.5	+ 0.6	. .	. .
14	E.	.	2 13 25.17	+ 0.07	. .	. .	.	78 30 30.7	− 1.1	. .	. .

SMALL PLANETS.

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
				CERES, ①.				
1877.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
July 6	P.	. . .	. . .	21 21 47.01	+ 5.43	116 46 58.2	− 13.0	
12	F.	. . .	. . .	21 18 8.50	+ 5.61	117 28 9.8	− 13.8	
14	P.	. . .	. . .	21 16 46.12	+ 5.69	117 41 56.8	− 12.6	
30	P.	. . .	. . .	21 3 41.40	+ 6.07	119 25 13.8	− 11.1	
				PALLAS, ②.				
June 23	S.	. . .	. . .	19 20 59.41	− 0.54	68 23 7.7	− 1.0	
25	P.	. . .	. . .	19 19 27.76	− 0.56	68 23 3.0	+ 0.3	
July 6	P.	. . .	. . .	19 10 37.42	− 0.59	68 41 49.4	+ 1.7	
7	E.	. . .	. . .	19 9 48.16	− 0.52	68 45 9.1	+ 0.4	
8	F.	. . .	. . .	19 8 58.94	− 0.42	68 48 47.7	+ 1.8	
12	F.	. . .	. . .	19 5 42.58	− 0.38	69 5 58.1	+ 0.8	
30	P.	. . .	. . .	18 52 18.09	− 0.53	71 12 19.0	+ 1.8	
				JUNO, ③.				
May 17	F.	. . .	. . .	16 57 1.40	+ 3.12	94 35 48.2	− 3.6	
28	E.	. . .	. . .	16 48 10.76	+ 2.60	93 59 48.8	+ 3.8	
31	P.	. . .	. . .	16 45 39.14	+ 2.51	93 52 17.5	+ 4.7	
June 1	E.	. . .	. . .	16 44 48.54	+ 2.65	93 50 2.4	+ 5.8	
14	F.	. . .	. . .	16 34 0.06	+ 2.60	93 32 20.3	+ 4.1	
19	S.	. . .	. . .	16 30 8.89	+ 2.69	93 31 36.2	+ 1.8	
22	F.	. . .	. . .	16 27 58.01	+ 2.43	93 32 50.1	+ 3.4	
28	P.	. . .	. . .	16 23 58.99	+ 2.45	93 38 47.2	+ 3.5	
July 7	E.	. . .	. . .	16 19 6.20	+ 2.40	93 56 8.2	+ 5.6	
14	P.	. . .	. . .	16 16 21.06	+ 2.17	94 15 52.2	+ 3.2	
16	F.	. . .	. . .	16 15 45.02	+ 2.40	94 22 27.7	+ 5.6	
				VESTA, ④.				
Oct. 15	E.	. . .	. . .	23 28 5.21	+ 0.96	105 18 32.8	− 5.8	
				HEBE, ⑥.				
May 2	S.	13 33.9	19 20.5	16 19 1.34	+ 5.80	88 39 1.2	+ 24.9	
17	F.	12 22.2	18 9.3	16 6 14.79	+ 5.78	87 34 41.9	+ 26.9	
18	S.	12 17.4	18 4.5	16 5 18.87	+ 5.87	87 31 45.7	+ 25.1	
22	S.	11 57.8	17 45.0	16 1 32.48	+ 5.86	87 22 7.1	+ 23.2	
24	E.	11 48.1	17 35.3	15 59 38.71	+ 5.86	87 18 37.4	+ 27.2	
28	E.	11 28.6	17 15.8	15 55 52.41	+ 5.96	87 14 3.5	+ 26.2	
June 1	E.	11 9.3	16 56.4	15 52 10.35	+ 5.81	87 13 1.0	+ 25.8	

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
IRIS, ⑦.								
1877.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
Dec. 3	P.	10 24.7	16 19.0	3 16 55.92	+ 5.23	68 22 6.5	− 12.1	
11	F.	9 49.6	15 43.6	3 13 20.97	+ 5.06	69 22 31.5	− 11.4	
14	E.	9 37.1	15 30.9	3 22 35.57	+ 4.97	69 42 32.0	− 12.3	
PARTHENOPE. ⑪.								
May 15	P.	12 57.3	18 47.7	16 33 30.54	+ 1.46	104 51 24.1	+ 8.6	
17	F.	12 47.8	18 38.0	16 31 44.24	+ 1.43	104 47 43.6	+ 9.7	
18	S.	12 42.7	18 32.0	16 30 49.92	+ 1.53	104 45 56.1	+ 9.6	
24	E.	12 13.6	18 4.2	16 25 9.86	+ 1.38	104 36 8.0	+ 9.6	
28	E.	11 53.9	17 44.5	16 21 15.89	+ 1.51	104 30 40.6	+ 9 4	
June 1	E.	11 34.3	17 25.0	16 17 21.18	+ 1.38	104 26 17.0	+ 10.0	
THETIS, ⑰.								
Nov. 2	S.	13 15.9	. . .	4 6 26.02	. .	77 19 52.7	. .	
13	F.	12 22.6	. . .	3 56 17.64	. .	77 51 56.9	. .	
Dec. 3	P.	10 44.6	. . .	3 36 51.69	. .	78 33 16.0	. .	
8	F.	10 20.7	. . .	3 32 35.38	. .	78 38 59.6	. .	
11	F.	10 6.4	. . .	3 30 14.90	. .	78 39 29.6	. .	
MELPOMENE, ⑱.								
Dec. 3	P.	11 43.6	17 37.2	4 35 57.21	+ 7.64	88 8 21.3	− 4.1	
11	F.	11 4.4	16 57.8	4 28 18.72	+ 7.49	87 46 39.4	− 4.5	
14	E.	10 50.0	16 43.2	4 25 44.17	+ 7.28	87 33 43.6	− 5.1	
THEMIS, ㉔.								
July 30	P.	11 39.8	17 20.9	20 15 27.45	− 0.09	110 58 28.0	− 0.1	
PROSERPINA, ㉖.								
Dec. 11	F.	13 55.1	. . .	7 19 31.92	. .	63 20 45.3	. .	Parallax not applied.
EUPHROSYNE, ㉛.								
Dec. 3	P.	13 10.6	18 59.1	6 3 20.97	− 7.40	32 48 50.6	+ 12.1	
11	F.	12 27.9	18 16.6	5 51 58.07	− 7.95	31 26 8.4	+ 13.3	
POLYHYMNIA, ㉝.								
May 2	S.	10 33.5	16 15.7	3 18 5.19	− 3.09	99 11 33.6	− 20.3	
FIDES, ㊲.								
Dec. 11	F.	13 1.3	18 52.8	6 25 29.28	+11.49	61 12 2.7	− 4.6	
19	F.	12 21.8	18 13.4	6 17 22.31	+11.82	61 2 17.3	− 1.5	

NOTES.

ARIADNE, ㊸.

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
1877.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″
July 6	P.	13 30.1	19 24.7	20 31 24.18	− 8.81	105 3 6.9	+ 20.6
12	F.	13 1.6	18 56.3	20 26 32.41	− 8.84	104 59 1.5	+ 29.8
14	P.	12 52.0	18 46.8	20 24 45.42	− 8.89	104 58 34.7	+ 30.4
30	P.	11 33.9	17 28.6	20 9 33.46	− 8.84	105 6 39.5	+ 29.1

AGLAIA, ㊼.

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
Nov. 2	.	. . .	. . .	2 59 7.90	. .	67 41 35.4	. .
3	F.	12 4.0	. . .	2 58 11.67	. .	67 44 2.5	. .
12	E.	11 20.2	. . .	2 49 45.79	. .	68 9 3.7	. .
13	F.	11 15.3	. . .	2 48 50.76	. .	68 12 15.7	. .
16	E.	11 0.9	. . .	2 46 9.30	. .	68 21 34.1	. .

PALES, ㊾.

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
May 14	S.	10 52.2	16 30.8	14 24 14.58	+ 0.04	108 27 42.6	+ 14.0

MELETE (56),

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
Mar. 15	P.	12 35.7	18 23.2	12 11 26.57	− 2.16	94 20 52.7	− 10.5
29	E.	11 29.1	17 17.0	11 59 50.25	− 1.82	92 24 47.1	− 11.4
30	F.	11 24.3	17 12.2	11 59 0.74	− 2.05	92 16 16.9	− 10.6
April 5	P.	10 56.0	16 43.8	11 54 14.82	− 2.00	91 25 43.2	− 11.5
11	F.	10 28.1	. . .	11 49 54.45	. .	90 37 25.8	. .

ELPIS, (59).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
May 28	E.	13 11.4	18 57.7	17 36 59.74	+ 0.83	100 11 47.4	+ 5.2
31	P.	12 55.3	18 41.7	17 34 36.71	+ 0.15	100 5 4.9	+ 0.5
June 14	F.	11 48.3	17 35.0	17 22 33.72	+ 0.53	99 45 42.0	+ 0.2
19	S.	11 24.2	17 10.9	17 18 11.34	+ 0.53	99 43 55.9	+ 0.4
22	F.	11 9.9	16 56.5	17 15 37.58	+ 0.20	99 44 17.1	+ 3.6
23	S.	11 5.1	16 51.7	17 14 47.77	+ 0.55	99 44 32.6	− 0.5

ECHO, (60).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
Mar. 30	F.	12 56.7	18 46.8	13 31 34.28	+ 1.26	98 49 14.2	+ 7.6
April 5	P.	12 27.8	18 18.0	13 26 11.83	+ 1.20	98 6 38.6	+ 7.3
12	S.	11 53.8	17 43.9	13 19 45.71	+ 1.29	97 15 58.4	+ 5.2
14	E.	11 44.1	17 34.1	13 17 56.87	+ 1.43	97 1 45.3	+ 8.0
22	E.	11 5.9	16 55.7	13 11 3.26	+ 1.31	96 7 28.5	+ 7.3
23	F.	11 1.0	16 50.7	13 10 14.74	+ 0.91	96 1 5.6	+ 5.0

ERATO, (62).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
Nov. 12	E.	11 46.9	17 35.5	3 16 29.01	+ 0.34	75 24 45.1	− 2.0
13	F.	11 42.0	17 30.5	3 15 38.79	+ 0.10	75 27 44.3	+ 0.7
16	E.	11 27.8	17 16.3	3 13 10.13	+ 0.45	75 36 19.9	− 0.2
19	P.	11 13.6	17 2.1	3 10 43.70	+ 0.17	75 44 31.1	− 0.8
20	E.	11 8.8	16 57.2	3 9 56.50	+ 0.79	75 47 7.8	− 1.5

FREIA, (76).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.
Mar. 30	F.	10 23.5	. . .	10 58 1.97	. .	85 24 7.5	. .

IANTHE, (98).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
1877.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
April 25	P.	10 47.2	16 37.3	13 4 20.51	+48.98	113 31 16.2	−559.1	
May 1	F.	10 18.2	16 8.0	12 58 48.42	+47.06	113 21 58.5	−564.0	
2	S.	10 13.4	16 3.2	12 57 58.40	+46.98	113 20 2.0	−558.5	

HECATE, (100).

Feb. 17	E.	12 8.3	17 48.8	10 1 22.22	+ 0.44	74 41 59.0	− 1.1
19	S.	11 58.5	17 39.0	9 59 51.78	+ 0.56	74 31 30.5	− 2.9
21	E.	. . .	. . .	9 58 21.80	+ 0.78	74 21 16.1	− 1.0
28	P.	11 16.8	16 57.2	9 53 13.36	+ 0.20	73 47 9.0	− 0.8
Mar. 9	E.	10 35.5	16 15.5	9 47 12.13	+ 0.43	73 8 48.9	− 0.4

HERA, (103).

Oct. 15	E.	11 20.7	17 9.3	0 59 52.54	+ 0.05	91 52 51.4	+ 2.6
18	P.	11 6.6	16 55.1	0 57 33.06	− 0.25	92 8 3.2	+ 2.9
23	E.	10 43.2	16 31.5	0 53 54.46	+ 0.02	92 30 17.5	+ 2.9
31	E.	10 6.8	15 54.7	0 48 51.47	− 0.18	92 56 48.6	+ 3.2

DIONE, (106).

May 1	F.	10 47.5	16 26.3	13 28 9.70	−13.94	95 18 10.3	+ 81.8
2	S.	10 42.8	5 38.8	13 27 31.43	−13.26	95 15 22.2	+ 85.3

CAMILLA, (107).

April 7	F.	8 30.1	14 10.3	9 35 49.86	+ 4.91	79 56 9.6	− 31.7
11	F.	8 14.6	13 54.4	9 36 5.52	+ 5.59	79 44 13.5	− 28.7
12	S.	8 10.9	13 50.5	9 36 12.88	+ 6.23	79 41 29.0	− 30.8
14	E.	8 3.3	13 42.7	9 36 30.35	+ 6.74	79 36 27.3	− 28.7

LYDIA, (110).

Dec. 11	F.	13 4.3	18 50.7	6 28 29.29	+ 1.26	61 38 29.8	− 2.3

ATE, (111).

April 12	S.	10 47.0	16 35.8	12 12 46.89	−18.60	99 26 12.3	−512.0
14	E.	10 37.7	16 26.4	12 11 18.59	−18.11	99 15 59.8	−504.7

THYRA, (115).

Mar. 15	P.	12 30.3	18 17.7	12 5 59.82	+ 2.49	106 49 15.5	+ 17.9
29	E.	11 21.0	17 8.4	11 51 42.44	+ 2.78	105 54 0.4	+ 17.4
30	F.	11 16.1	17 3.4	11 50 43.61	+ 2.53	105 49 2.6	+ 21.6
April 5	P.	10 46.9	16 34.1	11 45 8.54	+ 2.56	105 16 43.8	+ 16.9
11	F.	10 18.4	16 5.3	11 40 9.88	+ 2.82	104 42 13.9	+ 18.3
12	S.	10 13.7	16 0.6	11 39 24.10	+ 2.63	104 36 20.4	+ 16.1
14	E.	10 4.3	15 51.1	11 37 56.95	+ 2.69	104 24 39.0	+ 18.1

LACHESIS, (120).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
1877.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
Feb. 21	E.	11 22.1	17 6.5	9 30 54.58	+ 5.52	71 44 48.6	+ 37.8	
28	P.	10 49.1	. . .	9 25 26.18	. .	71 35 33.5	. .	

HERMIONE, (121).

Mar. 15	P.	11 53.8	17 31.6	11 29 21.55	− 4.43	75 37 33.4	− 33.1	
29	E.	10 49.7	16 27.0	11 20 19.86	− 3.89	74 54 18.8	− 32.2	
30	F.	10 45.1	. . .	11 19 44.00	. .	74 51 59.9	. .	

GERDA, (122).

July 6	P.	10 15.6	. . .	17 16 26.70	. .	110 46 56.1	. .	

BRUNHILD, (123).

Nov. 13	F.	. . .	. . .	1 29 32.32	. . .	69 19 59.3	. .	Parallax not applied.
16	E.	. . .	. . .	1 27 45.54	. .	69 37 18.6	. .	

ALKESTE, (124).

Nov. 2	S.	12 37.5	18 24.1	3 7 52.92	− 0.23	75 15 19.4	+ 1.8	
3	F.	12 12.7	17 59.3	3 6 58.19	− 1.24	75 19 58.3	+ 7.8	
12	E.	11 29.2	17 15.8	2 58 45.40	− 0.94	76 1 21.9	+ 8.0	
13	F.	11 24.2	17 10.7	2 57 50.91	− 1.22	76 5 56.8	+ 13.4	
16	E.	11 9.9	16 56.4	2 55 10.91	− 0.80	. . . .	. .	
20	E.	10 50.6	16 37.0	2 51 44.26	− 1.06	76 35 58.7	+ 8.7	

CYRENE, (133).

Mar. 30	F.	12 11.0	17 57.9	12 45 47.15	− 8.01	104 42 44.1	− 60.2	
April 5	P.	11 42.5	17 29.5	12 40 47.62	− 7.88	104 23 44.1	− 66.3	
11	F.	11 14.0	17 1.0	12 35 53.45	− 7.76	104 1 37.6	− 65.8	
12	S.	11 9.3	16 56.3	12 35 5.95	− 7.66	103 57 42.4	− 66.2	
14	E.	. . .	. . .	12 33 32.42	− 7.74	103 49 45.3	− 65.2	

AUSTRIA, (136).

Feb. 7	S.	11 16.3	17 5.5	8 29 55.90	+13.65	84 0 18.4	+ 37.9	One thread in R. A.
13	E.	10 47.5	16 36.5	8 24 36.88	+13.05	83 16 1.0	+ 34.9	

TOLOSA, (138).

Feb. 20	P.	12 21.0	18 7.7	10 25 52.48	+14.73	74 52 2.8	+ 89.7	
21	E.	12 16.0	18 2.7	10 24 55.10	+14.99	74 46 42.0	+ 90.7	
Mar. 7	S.	11 8.9	16 55.4	10 11 46.14	+14.27	73 40 21.1	+ 81.3	
9	E.	10 58.2	16 44.6	10 10 2.34	+14.72	73 [illegible]	+ 81.0	

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
GALLIA, (148).								
1876.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
Jan. 26	S.	11 44.2	17 32.0	8 10 29.60	. .	84 52 50.0	. .	
27	P.	11 39.4	17 27.2	8 9 37.09	. .	84 40 11.5	. .	
28	E.	11 34.6	17 22.4	8 8 45.39	. .	84 27 26.2	. .	
30	S.	11 25.1	17 12.8	8 7 3.55	. .	84 1 45.0	. .	
Feb. 6	F.	10 52.0	16 39.4	8 1 29.05	. .	82 30 29.8	. .	
7	S.	10 47.3	. . .	8 0 45.32	. .	82 17 23.9	. .	
ATALA, (152).								
Feb. 7	S.	12 30.1	18 15.3	9 43 51.85	. .	57 10 25.0	. .	
10	F.	12 15.6	18 0.7	9 41 3.47	. .	57 0 38.6	. .	
13	E.	12 1.0	17 46.0	9 38 15.91	. .	56 52 41.8	. .	
17	E.	11 41.6	17 26.6	9 34 35.68	. .	56 44 50.2	. .	
19	S.	11 31.9	5 44.0	9 32 48.45	. .	56 42 8.9	. .	
ÆMILIA, (159).								
Mar. 15	P.	10 53.5	. . .	10 28 55.15	. .	76 13 26.4	. .	
ATHOR, (161).								
Dec. 3	P.	8 4.4	. . .	0 56 9.77	. .	79 21 35.1	. .	
8	F.	7 45 5	. . .	0 57 1.66	. .	79 6 43.8	. .	
10	E.	7 38.2	. . .	0 57 34.76	. .	78 59 57.5	. .	
11	F.	7 34.6	. . .	0 57 53.29	. .	78 56 16.7	. .	
INO, (173).								
Dec. 3	P.	6 3.0	. . .	22 54 28.87	. .	107 8 52.8	. .	
8	F.	5 50.2	. . .	23 1 24.68	. .	106 32 4.2	. .	
9	P.	5 47.6	. . .	23 2 49.79	. .	106 24 16.5	. .	
10	E.	5 45.3	. . .	23 4 15.87	. .	106 16 24.9	. .	
IDUNNA, (176).								
Oct. 18	P.	11 12.6	. . .	1 3 38.69	. .	82 46 40.8	. .	No parallax.

CATALOGUE

OF

MISCELLANEOUS STARS

OBSERVED WITH THE

TRANSIT CIRCLE.

1877.

CATALOGUE

OF

MISCELLANEOUS STARS

OBSERVED IN

THE YEAR 1877

WITH

THE TRANSIT CIRCLE.

[NOTE.—Stars designated simply by hour and number (*e.g.*, VIII, 2) are from a list of zero-stars, selected by Professor Hall, to be used in a revision of the positions of the Washington Zones. "Transit Zones" and "Mural Zones" refer to the "Washington Zones, 1846–1849." The magnitudes are the means of the estimates in the individual observations.]

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.	Mean N. P. Distance, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
1	B. A. C. 5	8.0	0 2 24.98	+ 3.071	7.9	2	92 54 27.2	− 20.05	7.9	2
2	Lamont 18	. .	6 21.90	3.071	7.9	2	91 54 42.2	20.04	7.9	2
3	Weisse (2) 296	6.5	12 12.98	3.114	7.8	2	59 9 57.7	20.03	7.8	2
4	B. A. C. 69	. .	14 46.95	3.000	7.9	3	129 55 20.9	20.01	7.9	3
5	Lacaille 61	. .	16 40.80	2.991	7.9	3	129 56 42.4	20.00	7.9	3
6	B. A. C. 79	. .	0 17.6 . .	+ 3.200	. .	.	38 39 43.5	− 19.99	7.9	2
7	B. A. C. 79 (Ref.)	. .	. . .	. .	. .	.	38 39 44.3	19.99	7.9	2
8	Lalande 512	6.0	19 5.86	3.074	7.8	2	88 44 29.3	19.98	7.8	2
9	Lacaille 81	. .	19 17.13	2.978	7.9	3	129 56 23.8	19.98	7.9	3
10	12 Ceti	6.0	23 45.71	3.061	7.8	5	94 38 14.7	19.95	7.8	5
11	12 Ceti (R.)	. .	. . . . .	. .	. .	.	94 38 14.0	− 19.95	7.6	1
12	B. A. C. 123	7.5	0 25 25.70	+ 3.269	7.8	2	36 51 51.2	19.93	7.8	2
13	B. A. C. 126	. .	26.0 . .	3.360	. .	.	27 44 49.7	19.93	7.8	1
14	B. A. C. 126 (Ref.)	. .	. . .	. .	. .	. .	27 44 49.7	19.93	7.8	1
15	B. A. C. 136^1	. .	27 42.05	2.956	7.9	2	125 39 50.6	19.91	7.9	2
16	B. A. C. 136^2	. .	0 27 42.16	+ 2.956	7.9	2	125 39 56.5	− 19.91	7.9	2
17	B. A. C. 139	. .	28 21.99	3.372	7.9	1	28 48 48.0	19.90	7.9	1
18	B. A. C. 152	. .	30 5.55	3.240	7.8	1	46 10 24.0	19.88	7.8	1
19	B. A. C. 166	. .	32 45.18	3.182	7.1	2	59 48 44.1	19.85	7.3	3
20	B. A. C. 166 (Ref.)	. .	. . .	. .	. .	.	59 48 44.7	19.85	7.8	1
21	Weisse (2) 1062	8.0	0 42 30.06	+ 3.291	7.9	4	49 35 19.0	− 19.71	7.9	4
22	B. A. C. 226	. .	42 43.97	3.338	7.9	4	42 54 22.0	19.71	7.9	4
23	B. A. C. 227	3.5	43 2.12	3.285	7.9	4	49 35 28.7	19.70	7.9	4
24	B. A. C. 253	. .	49 17.79	3.567	7.6	3	29 56 59.2	19.59	7.6	4
25	B. A. C. 253 (Ref.)	. .	. . .	. .	. .	.	29 56 59.8	19.59	7.5	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.	Mean N. P. Distance, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
26	B. A. C. 259	. .	0 49 55.78	+ 3.296	7.5	2	52 10 5.0	− 19.58	7.5	2
27	Anonymous	10.5	51 32.06	3.081	7.9	1	88 21 17.6	19.55	7.9	1
28	2 Ursæ Minoris	4.0	52 15.06	7.002	7.5	4	4 24 13.9	19.53	7.5	3
29	2 Ursæ Minoris, S. P.	4.5	52 15.36	7.002	7.3	4	355 35 46.2	19.53	7.3	3
30	Anonymous	. .	54 52.90	3.094	7.8	1	85 57 42.2	19.48	7.8	1
31	B. A. C. 303	. .	0 58 30.32	+ 3.102	7.9	1	85 0 12.3	− 19.40	7.9	1
32	β Andromedæ	. .	1 2 50.91	3.325	7.4	14	55 1 56.5	19.31	7.4	14
33	Anonymous	. .	3 40.85	3.118	7.8	1	82 46 23.1	19.28	7.8	1
34	B. A. C. 345	. .	4 19.91	3.292	7.9	3	59 13 47.4	19.27	7.9	3
35	B. A. C. 450	. .	24 22.08	4.015	7.9	1	27 2 25.9	18.71	7.9	1
36	Anonymous.	. .	1 28 59.02	+ 3.262	7.9	1	69 23 38.7	− 18.56	7.9	1
37	B. A. C. 495	. .	32 37.67	3.223	7.9	2	73 59 58.2	18.44	7.9	2
38	Anonymous.	. .	33 2.92	3.277	7.9	1	68 43 30.5	18.43	7.9	1
39	B. A. C. 501	. .	33 17.55	3.560	7.8	1	47 19 30.8	18.42	7.8	1
40	B. A. C. 508^1	. .	34 8.88	3.926	7.9	3	31 59 41.6	18.39	7.9	3
41	Weisse 767	. .	1 44 20.55	+ 3.180	7.9	1	79 33 58.6	− 18.01	7.9	1
42	Weisse 791^1.	. .	45 30.60	3.179	7.9	1	79 47 52.6	17.97	7.9	1
43	Weisse 791^2.	. .	45 30.72	3.179	7.9	1	79 47 49.5	17.97	7.9	1
44	B. A. C. 569	. .	46.1 . .	3.403	. .	.	61 1 15.6	17.94	7.8	1
45	B. A. C. 569 (Ref.)	. .	. . .	. .	. .	.	61 1 18.8	17.94	7.8	1
46	B. A. C. 587	. .	1 50 17.62	+ 3.724	7.9	2	43 30 20.9	− 17.78	7.9	2
47	B. A. C. 609	. .	52 50.93	3.203	7.9	2	78 18 10.4	17.67	7.9	2
48	B. A. C. 646	. .	2 0 6.04	4.136	7.9	2	32 9 46.2	17.36	7.9	2
49	Piazzi II, 10.	. .	4 45.89	2.460	7.9	2	131 26 52.6	17.16	7.9	2
50	Lalande 3987	. .	5 40.69	4.720	7.8	1	22 53 37.8	17.11	7.8	1
51	Lalande 4219^2	8.5	2 9 58.85	+ 2.827	7.9	1	108 48 24.5	− 16.91	7.9	1
52	Bradley 329.	. .	13 8.04	3.027	7.8	3	93 32 13.2	16.77	7.8	3
53	Piazzi II, 57	9.9	13 15.74	3.027	7.8	3	93 31 57.6	16.76	7.8	3
54	Anonymous	. .	21 34.43	3.536	7.8	1	59 5 37.3	16.35	7.8	1
55	ξ^2 Ceti	4.5	21 37.27	3.180	7.9	6	82 5 32.6	16.35	7.9	6
56	Anonymous	. .	2 21 46.62	+ 3.537	7.8	1	59 3 25.1	− 16.35	7.8	1
57	B. A. C. 777	. .	26 22.61	3.322	7.9	3	17 43 17.5	16.10	7.9	3
58	Lalande 4803	6.2	29 20.38	3.162	7.9	6	83 42 3.6	15.95	7.9	6
59	Anonymous	. .	29 38.63	3.322	7.9	1	72 53 33.8	15.93	7.9	1
60	Lalande 4885	7.5	31 13.76	3.551	7.9	1	59 42 13.2	15.85	7.9	1
61	B. A. C. 863.	. .	2 41 44.12	+ 4.328	7.8	1	34 36 59.6	− 15.27	7.8	3
62	B. A. C. 863 (Ref.)	. .	. . .	. .	. .	.	34 37 1.0	15.27	7.8	2
63	O. Arg. N. 3176	. .	42 33.98	7.889	7.9	2	10 14 56.6	15.22	7.9	2
64	B. A. C. 872	. .	42 44.78	3.511	8.0	1	63 14 52.5	15.21	8.0	1
65	B. A. C. 893	. .	46 2.47	2.317	7.9	4	130 26 26.0	15.02	7.9	4

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.	Mean N. P. Distance, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
66	Anonymous. . . .	11.5	2 50 45.64	+ 3.421	7.9	2	68 56 41.9	− 14.74	7.9	2
67	ε Arietis	. .	52 10.84	3.419	7.9	1	69 9 10.5	14.66	7.9	1
68	O. Arg. N. 3326. . .	. .	52 33.88	8.162	7.9	2	10 11 2.3	14.64	7.9	2
69	B. A. C. 908. . . .	6.0	52 46.20	8.840	7.9	1	9 0 31.1	14.62	7.9	1
70	B. A. C. 908, S. P. . .	6.2	52 46.04	8.840	7.4	1	350 59 27.7	14.62	7.4	1
71	B. A. C. 962	. .	3 0 11.97	+ 4.166	7.3	1	40 51 30.5	− 14.17	7.7	3
72	B. A. C. 962 (Ref.) . .	. .	. . .	. .	. .	.	40 51 29.8	14.17	7.8	2
73	Taylor 1144	. .	15 1.23	2.380	7.7	3	133 32 29.6	13.22	7.7	3
74	B. A. C. 1074 . . .	. .	21 10.64	2.315	7.7	3	126 21 11.3	12.81	7.7	3
75	Lacaille 1103 . . .	. .	21 13.94	2.314	7.7	3	126 23 25.0	12.81	7.7	3
76	B. A. C. 1085 . . .	. .	3 23 26.90	+ 2.311	7.7	3	126 16 49.6	− 12.66	7.7	3
77	Lalande (F.) 519 . .	. .	26 24.26	19.057	7.6	3	3 44 40.9	12.46	7.6	3
78	Lalande (F.) 519, S. P.	6.2	26 23.74	19.057	7.3	1	356 15 17.9	12.46	7.3	1
79	ε Eridani	. .	27 8.12	2.889	7.9	1	99 52 33.3	12.41	7.9	1
80	B. A. C. 1125 . . .	. .	32 41.00	2.152	7.9	2	130 40 45.0	12.02	7.9	2
81	B. A. C. 1136^1 . . .	. .	3 35 21.40	+ 2.142	7.9	2	130 44 58.8	− 11.83	7.9	2
82	B. A. C. 1136^2 . . .	. .	35 21.85	2.142	7.9	2	130 45 5.0	11.83	7.9	2
83	B. A. C. 1145 . . .	. .	36 48.13	2.124	7.1	1	131 9 51.8	11.73	7.1	1
84	B. A. C. 1167 . . .	. .	39 45.14	2.119	7.1	1	131 2 48.0	11.52	7.1	1
85	B. A. C. 1227 . . .	. .	50 4.62	2.102	7.1	1	130 43 15.5	10.77	7.1	1
86	B. A. C. 1247 . . .	5.2	3 59 52.68	+13.233	7.8	2	6 29 54.0	− 10.03	7.8	2
87	B. A. C. 1247, S. P. . .	. .	59 52.31	13.233	7.4	1	353 30 5.7	10.03	7.4	1
88	B. A. C. 1287 . . .	. .	4 5 52.34	4.381	8.0	1	41 54 18.2	9.58	8.0	1
89	51 Tauri	. .	11 6.55	3.535	7.1	1	68 43 24.4	9.17	7.1	1
90	53 Tauri	. .	12 11.21	3.526	7.1	1	69 9 26.7	9.09	7.1	1
91	62^1 Tauri	. .	4 16 32.89	+ 3.608	7.1	2	65 59 5.2	− 8.75	7.1	2
92	62^2 Tauri	. .	16 34.89	3.608	7.1	3	65 59 15.7	8.74	7.1	3
93	Weisse 326	8.5	17 16.72	3.130	7.9	3	87 14 55.4	8.69	7.9	3
94	Weisse 340	. .	18 2.02	3.118	8.0	2	87 47 35.8	8.63	8.0	2
95	Weisse 381	7.8	19 35.92	3.088	7.9	2	89 15 0.5	8.51	7.9	2
96	B. A. C. 1373 . . .	. .	4 20 42.82	+ 3.546	7.1	1	68 39 24.6	− 8.42	7.1	1
97	Lalande 8437 . . .	. .	22 25.94	3.117	8.0	2	87 54 3.0	8.28	8.0	2
98	Weisse 544	8.2	27 11.42	3.088	7.9	2	89 14 20.1	7.90	7.9	2
99	Weisse 548	9.0	27 19.54	3.140	7.9	1	86 48 44.0	7.89	7.9	1
100	Weisse 632	. .	30 38.70	3.122	8.0	1	87 40 16.8	7.63	8.0	1
101	Weisse 685	8.8	4 32 46.05	+ 3.113	7.9	1	88 6 55.8	− 7.45	7.9	1
102	Anonymous . . .	. .	34 6.96	3.573	7.1	1	68 2 30.8	7.34	7.1	1
103	Weisse 727	. .	34 33.39	3.121	8.0	1	87 43 48.6	7.31	8.0	1
104	Lalande 8824^2 . . .	. .	34 36.02	3.087	8.0	2	89 16 39.2	7.30	8.0	2
105	Schjellerup 1499 . .	9.0	35 9.44	3.108	7.9	1	88 20 20.2	7.26	7.9	1

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.	Mean N. P. Distance, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
106	Weisse 777	. .	4 36 39.72	+ 3.090	8.0	1	89 7 36.7	− 7.14	8.0	1
107	Anonymous	. .	37 1.81	3.112	7.9	1	88 9 24.2	7.10	7.9	1
108	B. A. C. 1448	. .	37 24.36	10.957	7.3	3	9 0 58.4	7.07	7.3	3
109	B. A. C. 1448, S. P.	5.8	37 24.32	10.957	7.4	1	350 59 2.4	7.07	7.4	1
110	Weisse 817	. .	38 55.10	3.125	8.0	1	87 35 27.6	6.95	8.0	1
111	Weisse 902	8.0	4 43 9.55	+ 3.116	7.9	2	88 0 52.4	− 6.60	7.9	2
112	Weisse 936	. .	44 24.41	3.093	8.0	1	89 3 52.9	6.50	8.0	1
113	Schjellerup 1564	. .	45 52.32	3.108	7.9	1	88 21 30.2	6.37	7.9	1
114	B. A. C. 1514	. .	47.8 . .	3.121	. .	.	87 45 46.4	6.21	7.1	1
115	B. A. C. 1514 (Ref.)	. .	. . .	. .	. .	.	87 45 44.1	6.21	7.1	1
116	Lalande 9270	. .	4 49 47.54	+ 3.113	8.0	1	88 9 14.4	− 6.05	8.0	1
117	Weisse 1067	. .	49 47.80	3.138	7.9	1	87 1 16.1	6.05	7.9	1
118	B. A. C. 1536	. .	52.5 . .	5.312	. .	.	29 44 26.5	5.82	7.1	1
119	B. A. C. 1536 (Ref.)	. .	. . .	. .	. .	.	29 44 24.1	5.82	7.1	1
120	Lalande 9400	. .	53 41.49	3.141	8.0	2	86 53 57.3	5.72	8.0	2
121	Weisse 1223	. .	4 56 2.79	+ 3.114	8.0	1	88 7 56.8	− 5.53	8.0	1
122	Lalande 9484	. .	56 56.68	3.742	7.1	1	62 28 41.0	5.45	7.1	1
123	Lalande 9561	. .	58 36.06	3.128	7.9	1	87 31 35.4	5.31	7.9	1
124	Durch. 27°, 744	9.0	5 9 9.97	3.753	7.5	2	62 25 19.3	4.42	7.5	2
125	B. A. C. 1619	. .	10 23.28	9.154	7.1	1	12 7 29.2	4.31	7.1	1
126	B. A. C. 1650	7.0	5 13 2.98	+ 2.155	7.1	4	125 1 2.0	− 4.08	7.1	4
127	B. A. C. 1662	6.2	22 45.53	18.567	7.5	2	4 52 17.8	3.25	7.5	2
128	B. A. C. 1662, S. P.	6.5	22 45.90	18.567	7.4	2	355 7 42.5	3.25	7.4	2
129	Lacaille 1855	. .	23 16.23	2.231	7.1	1	122 31 12.8	3.20	7.1	1
130	Weisse 633	. .	26 52.52	2.919	7.1	3	96 35 5.8	2.89	7.1	3
131	Weisse 632	. .	5 26 52.82	+ 2.919	7.1	3	96 35 43.0	− 2.89	7.1	3
132	θ^1 Orionis	. .	29 14.11	2.945	7.1	1	95 28 22.1	2.69	7.1	1
133	θ^2 Orionis	. .	29 20.70	2.944	7.1	1	95 29 56.9	2.68	7.1	1
134	ι Orionis	. .	29 25.01	2.933	7.1	1	95 59 34.3	2.67	7.1	1
135	B. A. C. 1767	. .	30.3 . .	3.583	. .	.	68 56 5.0	2.59	7.1	1
136	B. A. C. 1767 (Ref.)	. .	. . . . .	. . .	. .	.	68 56 4.6	− 2.59	7.1	1
137	B. A. C. 1781	8.2	5 32 13.08	+ 2.138	7.1	1	125 8 34.8	2.43	7.1	1
138	B. A. C. 1794^1	2.5	34 33.15	3.025	7.5	2	92 0 34.3	2.23	7.5	2
139	B. A. C. 1794^2	5.0	34 33.32	3.025	7.5	2	92 0 37.2	2.23	7.5	2
140	Weisse (2) 1090	. .	35 36.64	4.117	7.1	2	51 48 38.7	2.13	7.1	2
141	Weisse (2) 1103	. .	5 35 48.02	+ 4.118	7.1	2	51 47 33.2	− 2.11	7.1	2
142	Durch. 38°, 1283	. .	37 50.25	4.115	7.1	2	51 54 42.6	1.94	7.1	2
143	Weisse (2) 1235	. .	39 7.61	4.116	7.1	2	51 52 40.6	1.83	7.1	2
144	B. A. C. 1825	. .	39 26.45	1.976	7.1	3	129 27 46.0	1.80	7.1	3
145	B. A. C. 1842	. .	41 20.62	1.979	7.1	3	129 21 48.9	1.63	7.1	3

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			h. m. s.	s.			° ′ ″	″		
146	B. A. C. 1843 . . .	. .	5 41 55.46	+ 2.844	7.1	2	99 42 55.8	− 1.58	7.1	2
147	B. A. C. 1849 . . .	. .	43 56.74	5.368	7.1	1	30 8 35.1	1.41	7.1	2
148	B. A. C. 1849 (Ref.) .	. .	. . .	. .	. .	.	30 8 33.8	1.41	7.1	2
149	B. A. C. 1889 . . .	7.8	48 21.67	2.041	7.1	3	127 39 31.3	1.00	7.1	3
150	B. A. C. 1891 . . .	6.8	48 39.04	2.177	7.1	3	123 49 48.6	1.00	7.1	3
151	B. A. C. 1892 . . .	. .	5 48 40.72	+ 2.008	7.1	1	128 33 14.9	− 0.988	7.1	1
152	Yarnall 2456 . . .	. .	50 53.26	2.303	7.1	2	119 56 22.4	0.796	7.1	2
153	Yarnall 2455 . . .	. .	50 55.08	2.301	7.1	2	119 59 16.5	0.796	7.1	2
154	Taylor 2245 . . .	. .	52 13.80	2.237	7.1	2	121 59 36.2	0.682	7.1	2
155	B. A. C. 1939 . . .	. .	56.6 . .	3.562	7.1	.	69 51 39.2	0.298	7.1	2
156	B. A. C. 1939 (Ref.) .	. .	. . . .	. .	. .	.	69 51 38.6	− 0.298	7.1	2
157	B. A. C. 1879 . . .	6.5	5 57 48.11	+26.734	7.9	1	3 14 15.6	0.193	7.9	1
158	B. A. C. 1879, S. P. .	7.0	57 48.63	26.734	7.5	1	356 45 44.3	0.193	7.5	1
159	Weisse (2) 1913 . .	. .	59 45.36	4.116	7.1	2	52 0 20.5	− 0.002	7.1	2
160	ν Orionis	. .	6 0 32.89	3.425	7.1	1	75 13 9.1	+ 0.044	7.1	1
161	Durch. 31°, 1217 . .	. .	6 2 27.35	+ 3.889	7.1	1	58 33 30.2	+ 0.219	7.1	1
162	Durch. 31°, 1221 . .	. .	2 44.06	3.886	7.1	1	58 39 8.1	0.336	7.1	1
163	Piazzi VI, 6 . . .	8.8	2 53.08	1.856	7.1	4	132 17 7.5	0.254	7.1	4
164	Piazzi VI, 12 . . .	8.0	4 3.85	1.863	7.1	2	132 8 11.2	0.359	7.1	3
165	Piazzi VI, 34 . . .	. .	7 7.80	1.724	7.1	3	135 15 23.8	0.621	7.1	3
166	B. A. C. 2036 . . .	. .	6 12 50.15	+ 2.040	7.1	1	127 41 47.3	+ 1.119	7.1	1
167	Lalande 12148[1] . .	. .	15 39.63	3.496	7.1	1	72 22 6.3	1.373	7.1	1
168	B. A. C. 2054 . . .	. .	15 44.90	1.975	7.1	2	129 26 2.5	1.373	7.1	2
169	B. A. C. 2072 . . .	8.7	18 36.07	2.275	7.1	1	120 52 59.9	1.626	7.1	1
170	O. Arg. N. 6808 . .	. .	19 6.42	10.390	7.1	2	10 18 46.6	1.669	7.1	1
171	B. A. C. 2079 . . .	. .	6 19 45.04	2.185	7.1	1	123 38 42.9	+ 1.730	7.1	1
172	Brisbane 1230 . . .	. .	19 49.24	2.082	7.1	1	126 38 17.5	1.730	7.1	1
173	B. A. C. 2098 . . .	. .	21 50.43	1.919	7.1	4	130 54 15.5	1.905	7.1	4
174	O. Arg. S. 5133 . .	. .	22 14.08	2.429	7.1	2	115 46 48.3	1.940	7.1	2
175	O. Arg. S. 5144 . .	. .	22 43.73	2.430	7.1	1	115 46 13.8	1.983	7.1	1
176	O. Arg. S. 5176 . .	. .	6 24 9.96	+ 2.429	7.1	2	115 48 22.5	+ 2.105	7.1	2
177	B. A. C. 2117 . . .	. .	24 46.30	1.916	7.1	4	130 59 46.5	2.166	7.1	4
178	B. A. C. 2122 . . .	. .	25 7.29	1.945	7.1	2	130 17 32.5	2.192	7.1	2
179	O. Arg. S. 5198 . .	. .	25 7.60	2.430	7.1	2	115 48 7.1	2.192	7.1	2
180	O. Arg. S. 5199 . .	. .	25 8.59	2.430	7.1	2	115 48 26.7	2.192	7.1	2
181	23 (H.) Camelopard. . .	5.5	6 25 12.57	+10.372	7.4	3	10 18 30.0	+ 2.201	7.4	2
182	23 (H.) Camelopard. (Ref.)	. .	. . .	. .	. .	.	10 18 30.2	2.201	7.9	1
183	Brisbane 1256 . . .	. .	25 12.92	1.945	7.1	2	130 18 0.4	2.201	7.1	1
184	B. A. C. 2135 . . .	. .	26 41.67	1.944	7.1	2	130 21 46.6	2.331	7.1	2
185	B. A. C. 2147 . . .	. .	28 2.98	2.245	7.1	1	121 56 26.0	2.444	7.1	1

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			h. m. s.	s.			° ′ ″	″		
186	B. A. C. 2153	. .	6 29 2.34	+ 2.016	7.1	2	128 31 54.8	+ 2.531	7.1	2
187	B. A. C. 2179	. .	32 51.46	2.036	7.1	3	128 2 38.6	2.860	7.1	3
188	B. A. C. 2195	. .	35 45.59	2.038	7.1	3	128 2 43.6	3.120	7.1	3
189	B. A. C. 2194	. .	36.4 . .	3.695	. .	.	64 44 55.9	3.172	7.9	1
190	B. A. C. 2194 (Ref.)	. .	. . .	. .	. .	.	64 44 57.2	3.172	7.9	1
191	B. A. C. 2207^1	9.0	6 38 6.01	+ 2.031	7.1	2	128 16 47.8	+ 3.318	7.1	2
192	B. A. C. 2207^2	8.2	38 6.66	2.031	7.1	2	128 16 48.2	3.318	7.1	2
193	B. A. C. 2225	. .	41 59.11	2.058	7.1	3	127 38 41.8	3.646	7.1	3
194	B. A. C. 2231	. .	43 8.99	2.053	7.1	3	127 47 42.5	3.749	7.1	3
195	B. A. C. 2246	. .	45 14.85	2.241	7.1	1	122 22 6.9	3.929	7.1	1
196	B. A. C. 2258	. .	6 47 22.34	+ 2.118	7.1	2	126 4 54.4	+ 4.118	7.1	2
197	Yarnall 2790	. .	48 34.94	2.484	7.1	1	114 14 4.5	4.221	7.1	1
198	B. A. C. 2288	. .	52 53.54	2.149	7.1	1	125 20 42.1	4.588	7.1	1
199	Anonymous	. .	53 11.11	2.151	7.1	1	125 18 4.7	4.614	7.1	1
200	B. A. C. 2295	. .	53 55.10	2.197	7.1	2	123 56 46.9	4.673	7.1	2
201	Weisse (2) 1656	. .	6 56 10.26	+ 3.733	7.1	2	62 59 9.4	+ 4.869	7.1	2
202	B. A. C. 2305	. .	56.8 . .	3.563	. .	.	69 15 4.9	4.920	7.1	1
203	B. A. C. 2305 (Ref.)	. .	. . .	. .	. .	.	69 15 3.8	4.920	7.1	1
204	Lalande 13681	. .	58 27.63	3.771	7.1	4	61 37 28.8	5.063	7.1	4
205	Lalande 13700	. .	59 1.71	3.771	7.1	3	61 35 59.8	5.006	7.1	3
206	Lalande 13724	. .	6 59 41.93	+ 3.769	7.1	4	61 38 9.9	+ 5.165	7.1	3
207	Lalande 13757	. .	7 0 36.51	3.770	7.1	4	61 36 6.6	5.241	7.1	4
208	Piazzi VI, 344	. .	2 3.54	1.907	7.1	1	132 8 24.1	5.368	7.1	1
209	Durch. 28°, 1331	. .	3 58.95	3.766	7.1	3	61 36 34.9	5.520	7.1	3
210	Lalande 13905	. .	4 42.38	3.767	7.1	4	61 35 12.5	5.586	7.1	4
211	B. A. C. 2326	. .	7 5 4.54	13.020	7.3	2	7 21 29.7	+ 5.620	7.3	2
212	B. A. C. 2326, S. P.	. .	5 5.44	13.020	7.2	2	352 38 31.4	5.620	7.2	2
213	B. A. C. 2372	. .	7 12.22	2.039	7.1	2	128 53 59.8	5.796	7.1	2
214	Taylor 2910	7.0	7 19.81	2.315	7.1	2	120 37 2.2	5.805	7.1	2
215	B. A. C. 2386	. .	9 10.62	2.331	7.2	1	120 7 48.5	5.964	7.2	1
216	δ^1 Geminorum	. .	7 12 46.44	+ 3.590	7.1	1	67 47 41.5	+ 6.264	7.1	1
217	B. A. C. 2427	. .	14 22.03	2.047	7.1	1	128 59 11.8	6.388	7.1	1
218	B. A. C. 2446	. .	17 54.17	2.290	7.1	1	121 48 41.3	6.686	7.1	1
219	B. A. C. 2439	. .	18 3.70	6.307	7.1	2	21 17 11.6	6.702	7.1	2
220	B. A. C. 2439, S. P.	. .	18 3.81	6.307	7.6	1	338 42 47.7	6.702	7.6	1
221	B. A. C. 2439 (Ref.)	. .	. . . .	. .	. .	.	21 17 9.7	. .	7.1	2
222	B. A. C. 2449	. .	7 18 18.58	+ 2.294	7.1	1	121 41 18.1	+ 6.720	7.1	1
223	B. A. C. 2471	. .	22 8.24	2.231	7.1	2	123 53 40.2	7.031	7.1	2
224	B. A. C. 2477^1	. .	24 7.83	2.304	7.1	3	121 35 47.2	7.195	7.1	3
225	B. A. C. 2477^2	. .	24 8.38	2.304	7.1	3	121 35 41.5	7.195	7.1	3

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			h. m. s.	s.			° ′ ″	″		
226	Piazzi VII, 137 . .	5.0	7 25 55.65	+ 2.333	7.1	3	120 42 18.6	+ 7.342	7.1	3
227	α^1 Geminorum . . .	. .	26 44.54	3.853	7.2	4	57 50 41.9	7.415	7.2	4
228	B. A. C. 2502 . . .	6.5	29 24.04	2.171	7.1	4	126 4 21.0	7.626	7.1	4
229	B. A. C. 2523 . . .	. .	32 49.11	2.221	7.1	2	124 41 34.8	7.900	7.1	2
230	Anonymous . . .	. .	32 55.90	2.175	7.1	3	126 8 29.6	7.909	7.1	3
231	B. A. C. 2536 . . .	6.2	7 34 16.55	+ 2.175	7.1	3	126 13 2.8	+ 8.021	7.1	3
232	B. A. C. 2543 . . .	. .	35 7.31	2.115	7.1	3	128 1 36.6	8.085	7.1	3
233	B. A. C. 2545 . . .	. .	35 23.07	2.122	7.1	1	127 51 26.0	8.109	7.1	1
234	B. A. C. 2546 . . .	. .	35 27.56	2.118	7.1	3	127 58 41.6	8.117	7.1	3
235	B. A. C. 2561 . . .	. .	38 41.95	2.197	7.1	3	125 45 32.4	8.372	7.1	3
236	B. A. C. 2572 . . .	. .	7 39 40.05	+ 2.199	7.1	3	125 46 17.0	+ 8.451	7.1	3
237	B. A. C. 2575 . . .	. .	40 11.45	2.138	7.1	1	127 38 53.6	8.491	7.1	1
238	Lacaille 2956 . . .	. .	40 41.48	2.141	7.1	1	127 35 27.5	8.531	7.1	1
239	B. A. C. 2580 . . .	. .	40 52.40	2.138	7.1	1	127 40 17.7	8.547	7.1	1
240	B. A. C. 2604 . . .	. .	43 56.19	2.051	7.1		130 20 47.8	8.784	7.1	2
241	B. A. C. 2614 . . .	. .	7 45 2.02	+ 2.052	7.1	2	130 23 33.6	+ 8.870	7.1	2
242	B. A. C. 2609 . . .	. .	45 45.00	4.396	7.1	2	42 7 7.6	8.925	7.1	6
243	B. A. C. 2609 (Ref.) .	. .	. . .	. .	. .	.	42 7 8.4	8.925	7.1	6
244	B. A. C. 2634 . . .	. .	47 59.36	2.063	7.1	2	130 15 36.6	9.105	7.1	2
245	B. A. C. 2659 . . .	6.0	53 44.29	3.446	7.1	3	72 21 20.8	9.554	7.1	3
246	B. A. C. 2685 . . .	. .	7 57 7.58	+ 2.195	7.1	1	126 56 35.7	+ 9.806	7.1	1
247	B. A. C. 2697 . . .	. .	59.2 . .	4.550	. .	.	38 8 28.4	9.967	7.1	2
248	B. A. C. 2697 (Ref.) .	. .	. . .	. .	. .	.	38 8 29.0	9.967	7.1	2
249	B. A. C. 2717 . . .	. .	8 0 19.07	2.314	7.1	2	123 14 34.4	10.051	7.1	2
250	B. A. C. 2677 . . .	6.2	0 33.40	12.224	7.1	1	7 11 37.9	10.065	7.1	1
251	B. A. C. 2677, S. P. .	6.5	8 0 33.58	+12.224	7.4	1	352 48 22.7	+10.06	7.4	1
252	B. A. C. 2719¹ . . .	. .	1 0.11	2.316	7.1	2	123 13 9.0	10.10	7.1	2
253	B. A. C. 2719² . . .	. .	1 1.94	2.316	7.1	2	123 13 7.5	10.10	7.1	2
254	B. A. C. 2743 . . .	. .	4 31.08	2.268	7.1	1	125 5 45.2	10.37	7.1	1
255	B. A. C. 2758 . . .	. .	6 28.98	2.216	7.1	3	126 55 41.0	10.51	7.1	3
256	B. A. C. 2762 . . .	5.5	8 6 57.82	+ 2.143	7.2	1	129 15 12.1	+10.55	7.2	1
257	B. A. C. 2775 . . .	. .	7 19.27	2.369	7.1	1	121 46 8.5	10.58	7.1	1
258	B. A. C. 2780 . . .	5.0	9 40.67	2.126	7.2	1	129 58 24.9	10.75	7.2	1
259	B. A. C. 2778 . . .	. .	9.8 . .	3.262	. .	.	80 26 14.2	10.76	7.1	2
260	B. A. C. 2778 (Ref.) .	. .	. . .	. .	. .	.	80 26 13.2	10.76	7.1	2
261	B. A. C. 2794 . . .	. .	8 13 35.73	+ 2.288	7.1	3	125 4 8.5	+11.04	7.1	3
262	B. A. C. 2795 . . .	. .	13 57.09	.253	7.2	3	126 16 45.9	11.06	7.2	3
263	B. A. C. 2809 . . .	8.2	16 57.13	2.169	7.1	3	129 13 48.2	11.29	7.1	3
264	B. A. C. 2820 . . .	7.8	18 44.23	2.216	7.1	3	127 53.5 . .	11.41	. .	.
265	B. A. C. 2819 . . .	3.5	20 1.91	5.059	7.4	2	28 52 23.2	11.50	7.2	5

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			h. m. s.	s.			° ′ ″	″		
266	B. A. C. 2819 (Ref.)	. .	. . . .	. .	. .	.	28 52 19.8	+11.50	7.1	4
267	Anonymous	. .	8 21 31.06	+ 3.210	7.1	1	82 45 42.0	11.61	7.1	1
268	Lacaille 3325	. .	22 19.88	2.412	7.2	3	121 16 5.9	11.67	7.2	3
269	Anonymous	. .	22 54.20	3.205	7.1	1	83 0 13.8	11.71	7.1	1
270	η Cancri	6.1	25 35.58	3.482	7.1	2	69 8 33.8	11.90	7.1	3
271	η Cancri (Ref.)	. .	. . . .	. .	. .	.	69 8 33.2	+11.90	7.1	1
272	Lacaille 3373	. .	8 26 33.46	+ 2.214	7.1	2	128 38 51.4	11.96	7.1	2
273	B. A. C. 2877	. .	26 52.12	2.215	7.1	2	128 39 0.0	11.99	7.1	2
274	Brisbane 2071	. .	27 24.18	2.217	7.2	1	128 39 1.9	12.03	7.2	1
275	B. A. C. 2890	. .	29 4.43	2.228	7.1	1	128 25 44.3	12.15	7.1	1
276	B. A. C. 2900	. .	8 30 41.22	+ 2.198	7.1	2	129 32 58.0	+12.26	7.1	2
277	Anonymous	. .	30 52.23	3.181	7.1	1	84 7 46.0	12.27	7.1	1
278	B. A. C. 2901	. .	31.1 . .	3.185	. .	.	83 52 7.9	12.29	7.1	1
279	B. A. C. 2901 (Ref.)	. .	. . .	. .	. .	.	83 52 7.9	12.29	7.1	1
280	B. A. C. 2933	8.0	34 39.76	2.308	7.1	4	126 10 31.3	12.53	7.1	4
281	B. A. C. 2941	. .	8 35 48.40	+ 2.205	7.1	3	129 49 42.0	+ 12.61	7.1	3
282	B. A. C. 2974	7.0	40 7.83	2.309	7.1	3	126 42 5.8	12.90	7.1	3
283	B. A. C. 2980	. .	41 56.26	2.382	7.1	3	124 10 24.3	13.02	7.1	3
284	Lacaille 3525	. .	42 30.73	2.384	7.1	3	124 8 59.9	13.06	7.1	3
285	B. A. C. 3009	. .	45 4.59	2.233	7.3	1	129 51 47.8	13.23	7.3	1
286	B. A. C. 3012	8.5	8 45 13.86	+ 2.268	7.1	3	128 41 8.2	+13.24	7.1	3
287	B. A. C. 3024	. .	47 22.39	2.220	7.3	1	130 31 30.1	13.38	7.3	1
288	B. A. C. 3030	. .	48 6.32	2.289	7.2	3	128 15 41.3	13.43	7.2	3
289	O. Arg. N. 9450	8.8	49 56.07	4.187	7.2	2	41 28 41.3	13.54	7.2	2
290	B. A. C. 3081	6.5	55 30.04	2.241	7.1	3	130 46 34.0	13.90	7.1	3
291	B. A. C. 3079	. .	8 55 32.64	+ 3.520	7.1	3	65 3 53.1	+13.90	7.1	3
292	Abo 185	. .	56 38.94	4.270	7.2	2	38 41 17.1	13.97	7.2	2
293	B. A. C. 3094	. .	57 23.70	2.300	7.2	3	128 55 12.0	14.02	7.2	3
294	Lalande 18067	. .	9 2 41.98	2.828	7.3	2	104 38 33.0	14.35	7.3	2
295	Lalande (F.) 1457	. .	5 59.09	4.303	7.3	2	36 47 19.0	14.55	7.3	2
296	Lalande (F.) 1458	. .	9 6 0.98	+ 4.303	7.3	2	36 47 8.6	+14.55	7.3	2
297	B. A. C. 3146	4.5	7 57.91	3.117	7.2	1	87 10 5.2	14.66	7.1	4
298	B. A. C. 3146 (Ref.)	. .	. . .	. .	. .	.	87 10 4.6	14.66	7.1	4
299	B. A. C. 3158	. .	10 2.96	2.389	7.1	3	127 5 32.4	14.79	7.1	3
300	B. A. C. 3163	. .	10 45.84	2.368	7.2	2	128 3 30.6	14.83	7.2	2
301	B. A. C. 3192^1	. .	9 15 31.96	+ 2.539	7.1	4	121 14 22.4	+15.11	7.1	4
302	B. A. C. 3192^2	. .	15 32.20	2.539	7.1	2	121 14 23.1	15.11	7.1	2
303	B. A. C. 3193	. .	15 33.30	2.408	7.1	4	127 3 38.0	15.11	7.1	4
304	Bradley 1321	. .	17 49.83	3.394	7.2	1	69 41 13.4	15.24	7.2	1
305	B. A. C. 3230	. .	21 37.89	2.358	7.1	3	129 58 12.0	15.45	7.1	3

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			h. m. s.	s.			° ′ ″	″		
306	B. A. C. 3254^1 . . .	. .	9 25 29.78	+ 2.564	7.2	4	121 21 2.8	+ 15.67	7.2	4
307	B. A. C. 3254^2 . . .	. .	25 30.20	2.564	7.2	4	121 20 55.6	15.67	7.2	4
308	B. A. C. 3257 . . .	. .	25 51.47	2.375	7.1	3	129 55 46.2	15.69	7.1	3
309	B. A. C. 3262 . . .	7.0	26 16.62	2 566	7.2	5	121 19 50.8	15.71	7.2	5
310	B. A. C. 3267 . . .	. .	27 26.36	2.377	7.1	1	130 6 23.7	15.77	7.1	1
311	Piazzi IX, 142 . . .	6.8	9 31 52.34	+ 2.576	7.1	3	121 37 35.1	+ 16.01	7.1	3
312	B. A. C. 3303 . . .	. .	33.6 . .	3.064	. .	.	90 35 8.6	16.10	7.2	1
313	B. A. C. 3303 (Ref.) .	. .	. . .	. .	. .	.	90 35 7.6	16.10	7.2	1
314	Weisse 774	9.1	36 37.92	3.049	7.2	4	91 40 50.8	16.26	7.2	4
315	Anonymous . . .	10.6	36 45.64	3.049	7.2	3	91 42 46.5	16.27	7.2	3
316	B. A. C. 3346 . . .	. .	9 42 13.75	+ 4.362	7.6	1	30 23 2.1	+ 16.54	7.6	1
317	Anonymous . . .	. .	45 22.21	3.207	7.3	1	79 39 35.3	16.70	7.3	1
318	Lalande 19442 . . .	8.0	49 56.25	3.269	7.1	2	74 41 20.1	16 91	7.1	2
319	Weisse (2) 1047 . .	9.0	50 15.57	3.300	7.1	2	72 21 34.0	16.93	7.1	2
320	Durch. 17°, 2160 . .	. .	51 52.80	3.293	7.2	2	72 43 22.4	17.00	7.2	2
321	Weisse (2) 1106? . .	. .	9 53 30.02	+ 3.300	7.2	4	71 57 7.0	+ 17.08	7.2	4
322	Weisse (2) 1158 . .	9.2	55 35.94	3.284	7.1	3	72 58 21.9	17.17	7.1	3
323	Weisse (2) 1236 . .	7.0	59 0.37	3.270	7.2	2	73 38 44.8	17.32	7.2	2
324	B. A. C. 3452 . . .	. .	10 0 15.04	2.682	7.2	1	120 17 38.5	17.38	7.2	1
325	Weisse (2) 74 . . .	. .	5 24.42	3.249	7.2	2	74 31 2.7	17.60	7.2	2
326	B. A. C. 3494 . . .	. .	10 7 59.04	+ 2.673	7.1	1	122 25 32.4	+ 17.71	7.1	1
327	Weisse (2) 234 . . .	9.5	12 56.27	3.297	7.1	10	69 30 46.2	17.90	7.1	8
328	γ^2 Leonis	. .	13 11.68	3.296	7.2	11	69 32 16.6	17.92	7.2	10
329	30 (H.) Camelopardalis .	5.0	15 54.95	7.979	7.6	3	6 49 1.7	18.02	7.6	3
330	B. A. C. 3553 . . .	6.8	17 18.86	3.041	7.2	2	93 1 19.8	18.08	7.2	2
331	Weisse 331	. .	10 20 40.80	+ 3.191	7.1	1	78 3 28.4	+ 18.20	7.1	1
332	45 Leonis	. .	21 9.26	3.175	7.3	1	79 36 42.4	18.21	7.3	1
333	Weisse 361	. .	21 57.01	3.190	7.1	1	77 57 31.0	18.24	7.1	1
334	Anonymous . . .	11.5	28 51.10	3.199	7.2	2	76 13 15.5	18.49	7.2	2
335	B. A. C. 3652 . . .	5.5	34 14.23	4.395	7.3	1	20 16 52.9	18.66	7.2	2
336	B. A. C. 3652 (Ref.) .	. .	. . . . .	. .	. .	.	20 16 51.6	+ 18.66	7.2	2
337	B. A. C. 3742^1 . . .	4.5	10 48 57.05	+ 3.266	7.2	1	64 35 40.8	19.10	7.2	4
338	B. A. C. 3742^1 (Ref.) .	. .	. . .	. .	. .	.	64 35 41.4	19.10	7.2	3
339	B. A. C. 3742^2 . . .	7.0	48 57.53	3.266	7.2	1	64 35 43.5	19.10	7.2	1
340	B. A. C. 3763 . . .	6.0	53 25.56	2.823	7.1	3	123 4 38.2	19.21	7.1	3
341	Lalande (F.) 1794 . .	7.0	10 55 45.59	+ 3.776	7.2	1	27 40 56.4	+ 19.27	7.2	1
342	B. A. C. 3822 . . .	7.0	11 3 58.92	2.872	7.2	3	121 42 0.1	19.46	7.2	3
343	B. A. C. 3851 . . .	4.0	11.6 . .	3.249	. .	.	57 46 45.9	19.61	7.3	1
344	B. A. C. 3851 (Ref.) .	. .	. . .	. .	. .	.	57 46 45.8	19.61	7.3	1
345	B. A. C. 3877 . . .	. .	17.5 . .	3.121	. .	.	78 47 36.8	19.71	7.3	1

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			h. m. s.	s.			° ′ ″	″		
346	B. A. C. 3877 (Ref.)	. .	. . . .	. .	. .	.	78 47 36.0	+ 19.71	7.3	1
347	B. A. C. 3890	6.0	11 19 31.88	+ 2.906	7.1	2	125 23 17.1	19.74	7.1	2
348	B. A. C. 3891	. .	19 36.16	2.895	7.2	2	127 4 17.5	19.74	7.2	2
349	B. A. C. 3906	. .	23 5.68	4.559	7.1	2	8 11 45.4	19.79	7.1	2
350	Taylor 6170	9.5	25 14.16	2.875	7.1	1	134 17 23.5	19.82	7.1	1
351	Anonymous	11.8	11 26 40.90	+ 3.100	7.3	2	81 39 3.6	+ 19.84	7.3	2
352	B. A. C. 3934	. .	28 30.94	2.957	7.3	1	122 10 48.7	19.87	7.3	1
353	B. A. C. 3945	7.0	30 29.16	2.961	7.1	1	122 53 20.4	19.89	7.1	1
354	B. A. C. 3948	. .	31 55.30	2.969	7.3	1	122 18 20.0	19.90	7.3	1
355	B. A. C. 3981	4.5	39 33.04	3.207	7.2	2	41 32 18.0	19.97	7.2	2
356	B. A. C. 3981 (Ref.)	. .	. . . .	. .	. .	.	41 32 20.4	+ 19.97	7.2	1
357	Taylor 6304	5.5	11 40 39.37	+ 2.978	7.3	3	129 49 51.8	19.98	7.3	3
358	B. A. C. 4002	. .	44.3 . .	3.076	. .	.	87 32 33.0	20.01	7.2	1
359	B. A. C. 4002 (Ref.)	. .	. . .	. .	. .	.	87 32 32.3	20.05	7.2	1
360	B. A. C. 4079	7.5	12 0 53.83	3.071	7.2	3	79 39 9.0	20.05	7.2	3
361	B. A. C. 4092	6.0	12 2 33.20	+ 3.089	7.2	2	130 32 48.9	+ 20.05	7.2	2
362	Lalande 22954	. .	3 50.85	3.081	7.3	1	99 35 39.4	20.04	7.3	1
363	B. A. C. 4123	. .	9.3 . .	2.986	. .	.	32 17 3.2	20.04	7.4	1
364	B. A. C. 4123 (Ref.)	. .	. . .	. .	. .	.	32 17 1.6	20.04	7.4	1
365	γ Corvi	. .	9 28.95	3.089	7.2	1	106 51 33.0	20.04	7.2	1
366	B. A. C. 4165	6.8	12 14 19.86	+ 0.118	7.3	4	1 37 6.4	+ 20.02	7.3	3
367	B. A. C. 4165, S. P.	6.5	14 19.24	0.118	7.8	4	358 22 53.4	20.02	7.8	4
368	B. A. C. 4174	. .	17 7.71	3.141	7.2	1	124 43 49.3	20.00	7.2	1
369	B. A. C. 4185	6.0	19 10.00	3.054	7.2	1	32 32 24.8	19.98	7.2	1
370	B. A. C. 4195	. .	20.8 . .	3.005	. .	.	61 2 53.2	19.97	7.3	2
371	B. A. C. 4195 (Ref.)	. .	. . . .	. .	. .	.	61 2 52.4	+ 19.97	7.3	2
372	B. A. C. 4200	6.8	12 21 33.02	+ 3.081	7.3	2	93 56 5.0	19.97	7.3	2
373	B. A. C. 4209	5.8	23 17.79	3.009	7.3	2	65 12 39.3	19.95	7.3	2
374	Anonymous	. .	24 23.75	3.099	7.2	1	100 40 25.3	19.94	7.2	1
375	B. A. C. 4225	6.5	25 19.33	3.083	7.3	3	94 22 27.6	19.83	7.3	3
376	f Virginis	6.5	12 30 27.30	+ 3.088	7.3	2	95 9 14.5	+ 19.87	7.3	2
377	Weisse 498	9.0	31 13.32	3.081	7.3	1	92 53 33.0	19.87	7.3	1
378	B. A. C. 4268^1	. .	35.4 . .	3.075	. .	.	90 46 32.5	19.82	7.2	1
379	B. A. C. 4268^1 (Ref.)	. .	. . .	. .	. .	.	90 46 32.4	19.82	7.2	1
380	Lalande 23951	. .	45 1.53	3.131	7.3	3	102 48 39.0	19.67	7.3	3
381	32^1 Camelopardalis	. .	12 48 6.54	+ 0.384	7.3	3	5 54 47.3	+ 19.62	7.3	3
382	32^1 Camelopardalis, S. P.	. .	48 6.59	0.384	7.9	5	354 5 12.0	19 62	7.9	5
383	B. A. C. 4340	. .	49.4 . .	3.052	. .	.	85 54 44.9	19.59	7.7	1
384	12^1 Canum Venaticorum	5.0	50 15.04	2.836	7.3	8	51 1 16.0	19.56	7.3	8
385	B. A. C. 4355	. .	53 48.88	3.273	7.3	2	122 50 21.7	19.50	7.3	2

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			h. m. s.	s.			° ′ ″	″		
386	B. A. C. 4357^1 . . .	. .	12 54 17.89	+ 3.276	7.3	2	122 57 40.0	+ 19.50	7.3	2
387	B. A. C. 4357^2 . . .	. .	54 18.48	3.276	7.3	2	122 57 36.1	19.50	7.3	2
388	B. A. C. 4367 . . .	. .	56 3.22	3.005	7.6	2	78 22 45.2	19.46	7.6	2
389	B. A. C. 4389 . . .	6.1	13 0 20.05	2.713	7.2	3	44 4 23.7	19.36	7.2	3
390	50 Virginis	. .	3 19.14	3.134	7.4	2	99 40 22.4	19.29	7.4	2
391	B. A. C. 4417 . . .	5.2	13 5 11.93	+ 3.356	7.3	3	127 9 2.3	+ 19.25	7.3	3
392	Durch. 7°, 2641. . .	. .	18 33.05	3.014	7.4	1	82 39 29.6	18.89	7.4	1
393	Durch. 8°, 2710. . .	9.8	20 16.69	3.007	7.4	1	81 57 37.6	18.84	7.4	1
394	B. A. C. 4509 . . .	7.3	24 4.43	2.900	7.4	4	70 18 21.4	18.72	7.4	5
395	B. A. C. 4545 . . .	6.5	29 59.78	2.564	7.2	2	45 10 25.4	18.53	7.2	2
396	B. A. C. 4553 . . .	. .	13 32 12.08	+ 2.848	7.4	1	66 50 36.8	+ 18.45	7.4	1
397	B. A. C. 4562 . . .	6.2	34 48.00	2.870	7.3	4	69 25 18.2	18.36	7.3	4
398	B. A. C. 4563 . . .	7.6	34 48.46	2.870	7.3	4	69 21 50.0	18.36	7.3	4
399	Durch. 25°, 2658 . .	9.0	34 59.36	2.819	7.4	1	64 50 50.6	18.36	7.4	1
400	B. A. C. 4568 . . .	. .	36 4.36	2.286	7.4	1	34 41 44.3	18.32	7.4	1
401	B. A. C. 4568 (Ref.) .	. .	. . . . .	. .	. .	.	34 41 44.4	+ 18.32	7.4	1
402	B. A. C. 4595 . . .	6.5	13 40 59.35	+ 2.608	7.3	3	50 52 48.1	18.14	7.3	3
403	B. A. C. 4600 . . .	6.0	41 41.41	+ 2.605	7.3	3	50 50 30.2	18.11	7.3	3
404	B. A. C. 4643 . . .	6.5	45 55.39	− 2.052	7.4	1	6 37.9 . .	17.95	. .	.
405	B. A. C. 4643, S. P. .	. .	45 55.37	− 2.052	7.9	1	353 22 8.9	17.95	7.9	1
406	B. A. C. 4629^1 . . .	9.0	13 46 7.97	+ 3.435	7.4	1	121 19 26.0	+ 17.94	7.4	1
407	B. A. C. 4629^2 . . .	5.5	46 8.12	3.435	7.4	1	121 19 10.2	17.94	7.4	1
408	B. A. C. 4672 . . .	. .	55.4 . .	3.048	. .	.	87 51 34.6	17.56	7.3	1
409	B. A. C. 4672 (Ref.) .	. .	. . .	. .	. .	.	87 51 33.9	17.56	7.3	1
410	B. A. C. 4674 . . .	6.5	55 53.55	3.463	7.3	3	121 5 34.3	17.54	7.3	3
411	B. A. C. 4686 . . .	3.0	13 59 26.91	+ 3.551	7.4	2	125 45 50.9	+ 17.39	7.3	1
412	Lalande 26003 . . .	8.0	14 5 11.32	3.220	7.3	1	102 1 31.8	17.14	7.3	1
413	B. A. C. 4737 . . .	6.5	11 35.66	3.278	7.4	2	74 10 1.3	16.84	7.4	2
414	Groombridge 2097. .	. .	13 52.38	2.468	7.4	1	50 39 46.6	16.73	7.4	1
415	B. A. C. 4758 . . .	. .	14 44.67	2.464	7.4	1	50 38 24.7	16.69	7.4	1
416	B. A. C. 4759 . . .	. .	14 15 27.85	+ 3.674	7.3	1	128 56 55.9	+ 16.65	7.3	1
417	B. A. C. 4778 . . .	8.0	18 23.04	2.484	7.3	1	52 14 8.4	16.51	7.3	1
418	ρ Bootis	. .	26 31.74	2.594	7.6	2	59 5 17.2	16.10	7.5	3
419	ρ Bootis (Ref.) . . .	. .	. . .	. .	. .	.	59 5 16.5	16.10	7.5	1
420	B. A. C. 4818 . . .	. .	29 1.21	3.743	7.4	2	129 40 25.0	15.96	7.4	2
421	Anonymous . . .	10.0	14 30 46.68	+ 3.394	7.4	2	111 30 23.4	+ 15.87	7.4	2
422	B. A. C. 4870 . . .	. .	38 58.06	2.330	7.2	2	49 1 10.4	15.42	7.2	2
423	B. A. C. 4903 . . .	. .	44 55.65	2.139	7.4	2	43 22 13.7	15.08	7.2	2
424	B. A. C. 4905^2 . . .	. .	45.7 . .	2.757	. .	.	70 23 16.0	15.04	7.3	2
425	B. A. C. 4905^2 (Ref.) .	. .	. . .	. .	. .	.	70 23 16.9	15.04	7.3	2

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			h. m. s.	s.			° ′ ″	″		
426	B. A. C. 4967 . . .	6.5	14 58 34.46	+ 1.399	7.4	2	29 18 42.5	+ 14.27	7.3	3
427	B. A. C. 4982 . . .	6.0	58 43.96	− 4.601	7.4	1	6 59 4.5	14.26	7.4	1
428	B. A. C. 4982, S. P. .	5.8	58 44.87	− 4.601	7.9	1	353 0 56.1	14.26	7.9	1
429	B. A. C. 5017 . . .	. .	15 7 58.88	+ 3.923	7.3	3	131 1 58.5	13.69	7.3	3
430	B. A. C. 5035 . . .	5.8	10 52.86	3.912	7.3	3	130 20 10.4	13.49	7.4	2
431	B. A. C. 5046 . . .	3.5	15 13 18.28	+ 3.916	7.3	3	130 12 3.1	+ 13.35	7.3	3
432	Lacaille 6328 . . .	7.0	13 30.85	3.919	7.3	3	130 18 11.3	13.32	7.3	3
433	B. A. C. 5054 . . .	. .	14 0.35	3.795	7.4	2	125 48 50.2	13.29	7.4	2
434	B. A. C. 5069 . . .	. .	17 21.96	3.873	7.4	2	128 17 47.4	13.07	7.4	2
435	μ^2 Bootis	. .	19 51.95	2.278	7.4	1	52 13 14.0	12.90	7.4	1
436	B. A. C. 5092 . . .	. .	15 21 8.68	+ 1.950	7.4	1	42 30 18.4	+ 12.82	7.4	1
437	B. A. C. 5135^1 . . .	6.8	28 55.59	2.868	7.3	3	79 3 0.2	12.82	7.3	3
438	B. A. C. 5135^2 . . .	5.1	28 55.66	2.868	7.3	3	79 2 57.1	12.23	7.3	3
439	XV, 16	7.0	29 43.89	3.591	7.4	1	116 5 1.8	12.23	7.4	1
440	B. A. C. 5164 . .	. .	31 33.39	1.796	7.5	1	39 53 35.1	12.10	7.5	1
441	B. A. C. 5199 . . .	6.0	15 38 53.15	+ 3.816	7.4	3	124 17 45.3	+ 11.58	7.4	3
442	B. A. C. 5216 . . .	. .	40.5 . .	2.762	. .	.	74 11 31.2	11.47	7.1	1
443	B. A. C. 5216 (Ref.) .	. .	. . . .	. .	. .	.	74 11 32.6	11.47	7.1	1
444	O. Arg. N. 15653 . .	. .	43 38.68	1.439	7.4	2	34 8 52.9	11.24	7.4	2
445	O. Arg. N. 15662 . .	. .	44 15.34	1.439	7.4	1	34 13 47.5	11.19	7.4	1
446	B. A. C. 5248 . . .	. .	15 44 39.82	+ 1.439	7.4	2	34 14 46.6	+ 11.17	7.4	2
447	B. A. C. 5261 . . .	. .	47 48.83	3.738	7.5	1	120 43 15.8	10.94	7.5	1
448	O. Arg. S. 15068 . .	. .	51 12.39	3.603	7.5	1	115 7 36.8	10.69	7.5	1
449	B. A. C. 5311 . . .	. .	55 13.55	+ 3.974	7.4	1	128 15 27.5	10.39	7.4	1
450	B. A. C. 5352 . . .	. .	56 19.16	− 6.716	7.4	1	6 41 2.9	10.31	7.4	1
451	B. A. C. 5352, S. P. .	8.0	15 56 19.49	− 6.716	7.7	3	353 18 55.9	+ 10.31	7.7	3
452	β^1 Scorpii	. .	58 17.60	+ 3.479	7.2	2	109 27 49.4	10.16	7.2	2
453	B. A. C. 5348 . . .	. .	59.6 . .	1.155	. .	.	31 6 21.5	10.06	7.5	2
454	B. A. C. 5348 (Ref.) .	. .	. . . .	. .	. .	.	31 6 21.3	10.06	7.5	2
455	B. A. C. 5355^1 . . .	. .	16 1 42.06	3.808	7.4	2	122 19 14.4	9.90	7.4	1
456	B. A. C. 5355^2 . . .	. .	16 1 42.68	+ 3.808	7.4	2	122 19 12.5	+ 9.90	7.4	1
457	B. A. C. 5395 . . .	. .	6 26.74	3.525	7.4	1	111 5 4.0	9.54	7.4	1
458	B. A. C. 5435^1 . . .	7.8	11 44.99	3.776	7.4	3	120 36 6.6	9.13	7.4	3
459	B A. C. 5435^2 . . .	5.8	11 46.12	3.776	7.4	3	120 36 24.0	9.12	7.4	3
460	B. A. C. 5437^1 . . .	. .	11.8 . .	3.163	. .	.	94 23 29.4	9.12	7.4	1
461	B. A. C. 5437^1 (Ref.) .	. .	. . . . .	. .	. .	.	94 23 27.8	+ 9.12	7.4	1
462	B. A. C. 5451 . . .	8.5	16 14 57.06	+ 3.980	7.4	3	127 7 50.8	8.87	7.4	3
463	B. A. C. 5466 . . .	. .	16.5 . .	2.647	. .	.	70 33 25.8	8.75	7.5	1
464	B. A. C. 5466 (Ref.) .	. .	. . .	. .	. .	.	70 33 24.7	8.75	7.5	1
465	β Herculis	. .	24 55.88	2.583	7.3	2	68 14 28.7	8.09	7.3	3

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			h. m. s.	s.			° ′ ″	″		
466	β Herculis (Ref.) . . .	. .	. . . . .	. .	. .	.	68 14 29.2	+ 8.09	8.0	1
467	B. A. C. 5522 . . .	. .	16 25 11.27	+ 3.816	7.5	1	121 17 18.1	8.06	7.5	1
468	B. A. C. 5583 . . .	7.0	35 13.82	4.151	7.5	3	130 52 57.9	7.25	7.5	3
469	B. A. C. 5584 . . .	7.0	35 22.00	4.151	7.5	3	130 52 39.5	7.24	7.5	3
470	XVI, 17	6.0	37 18.77	3.745	7.4	2	118 16 42.6	7.08	7.4	2
471	XVI, 18	7.5	16 37 33.80	+ 3.904	7.5	1	123 37 5.5	+ 7.06	7.5	1
472	B. A. C. 5604 . . .	. .	37 38.91	2.295	8.0	1	58 10 24.3	7.06	8.0	1
473	XVI, 19	7.5	39 42.45	3.526	7.4	1	109 52 23.6	6.88	7.4	1
474	O. Arg. S. 15973 . .	. .	41 21.55	3.666	7.3	1	115 17 18.1	6.74	7.3	1
475	O. Arg. S. 15981 . .	. .	41 47.33	3.668	7.3	1	115 20 22.9	6.71	7.3	1
476	B. A. C. 5632 . . .	. .	16 42 11.72	+ 3.925	7.5	1	124 4 5.5	+ 6.58	7.5	1
477	B. A. C. 5643 . . .	. .	43.0 . .	1.128	. .	.	32 59 51.7	6.61	7.1	1
478	B. A. C. 5643 (Ref.) .	. .	. . .	. .	. .	.	32 59 52.5	6.61	7.1	1
479	H. IV, 50	. .	43 31.33	1.681	7.6	2	42 15 12.7	6.57	7.6	2
480	B. A. C. 5671 . . .	6.6	46 45.32	3.816	7.5	3	120 22 59.1	6.30	7.5	3
481	B. A. C. 5686 . . .	8.2	16 47 46.58	+ 2.717	7.5	2	74 23 16.2	+ 6.21	7.5	2
482	B. A. C. 5694 . . .	. .	49 0.60	3.872	7.5	2	122 8 18.9	6.11	7.5	2
483	Weisse 958	. .	51 49.52	3.165	7.4	1	94) 5.3	5.88	7.4	1
484	O. Arg. S. 16183¹ . .	9.8	52 27.76	3.642	7.5	1	114 51.7	5.82	7.5	1
485	O. Arg. S. 16183² . .	10.0	52 28.25	3.642	7.5	1	114 46.0	5.82	7.5	1
486	B. A. C. 5731 . . .	. .	16 55 34.94	+ 2.297	8.0	1	58 53 28.7	+ 5.56	8.0	1
487	Anonymous . . .	. .	56 57.92	3.176	7.4	1	94 37 3.0	5.44	7.4	1
488	B. A. C. 5781 . . .	. .	17 3 19.50	3.433	7.4	4	105 34 14.9	4.91	7.4	4
489	B. A. C. 5793 . . .	6.6	4 58.92	3.892	7.6	2	122 17 13.1	4.77	7.6	2
490	α² Herculis	. .	9 2.68	2.734	7.5	1	75 28 8.1	4.43	7.5	1
491	B. A. C. 5825 . . .	6.5	17 10 35.06	+ 3.981	7.5	1	124 50 58.3	+ 4.29	7.5	1
492	Anonymous . . .	10.1	16 21.47	3.011	7.5	3	87 20 19.6	3.79	7.5	3
493	Anonymous . . .	10.5	16 27.29	3.012	7.5	3	87 22 46.5	3.78	7.5	3
494	Lalande 31762 . . .	. .	19 55.41	2.079	7.5	1	52 57 54.3	3.49	7.5	1
495	B. A. C. 5895 . . .	. .	20 11.63	2.078	7.5	1	52 56 14.8	3.46	7.5	1
496	Durch. 16°, 3211¹ . .	10.0	17 26 31.84	+ 2.683	7.6	2	73 35 49.4	+ 2.91	7.6	2
497	Durch. 16°, 3211² . .	9.4	26 32.68	2.683	7.6	2	73 35 36.5	2.91	7.6	2
498	Weisse (2) 817 . . .	6.0	28 9.28	2.682	7.5	4	73 35 38.2	2.78	7.5	4
499	XVII, 10	9.0	29 55.46	3.863	7.5	2	120 49 52.8	2.63	7.5	2
500	Durch. 22°, 3173 . .	9.5	33 1.66	2.533	7.5	1	67 54 55.4	2.36	7.5	1
501	O. Arg. S. 17137 . .	. .	17 37 3.72	+ 3.755	7.5	3	117 10 17.9	+ 2.00	7.5	2
502	Anonymous . . .	10.5	37 9.84	3.754	7.6	1	117 7.8 . .	1.99	. .	.
503	Anonymous . . .	. .	37 25.48	3.787	7.5	1	118 16 10.8	1.97	7.5	1
504	O. Arg. S. 17166 . .	. .	38 8.35	3.755	7.5	3	117 9 45.2	1.91	7.5	2
505	XVII, 16	7.8	40 11.05	3.577	7.5	1	110 47 20.2	1.73	7.5	1

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			h. m. s.	s.			° ′ ″	″		
506	XVII, 19	8.5	17 43 22.79	+ 4.056	7.5	1	126 25 50.1	+ 1.45	7.5	1
507	ψ^2 Draconis	7.0	44 9.70	− 1.086	7.5	2	17 46 58.4	1.38	7.5	2
508	ψ^2 Draconis, S. P. . .	. .	44 9.42	− 1.086	7.5	2	342 13 1.0	1.38	7.5	2
509	B. A. C. 6072 . . .	6.0	50 51.02	+ 3.805	7.5	2	118 44 36.9	0.80	7.5	2
510	B. A. C. 6103 . . .	. .	56 33.28	4.040	7.5	1	125 54 9.5	0.30	7.5	1
511	B. A. C. 6117 . . .	. .	17 58 4.96	+ 4.044	7.5	1	126 1 37.5	+ 0.17	7.5	1
512	B. A. C. 6145 . . .	. .	18 2 9.71	3.867	7.5	1	120 44 44.8	− 0.19	7.5	1
513	B. A. C. 6166 . . .	7.2	5 36.73	3.907	7.5	1	121 59 46.1	0.49	7.5	1
514	B. A. C. 6275 . . .	. .	21 57.13	3.940	7.6	1	123 7 31.6	1.92	7.6	1
515	B. A. C. 6285 . . .	. .	23 0.84	3.938	7.6	2	123 4 7.0	2.01	7.6	2
516	Anonymous . . .	. .	18 24 19.85	+ 3.936	7.6	2	123 1 24.4	− 2.12	7.6	2
517	B. A. C. 6298^1 (N.). .	7.0	24 54.13	4.141	7.6	1	128 48 24.4	2.17	7.6	1
518	B. A. C. 6298^2 (S.) . .	6.5	24 54.17	4.141	7.6	1	128 48 45.2	2.17	7.6	1
519	B. A. C. 6305 . . .	. .	25 53.80	3.939	7.6	1	123 7 35.5	2.26	7.6	1
520	B. A. C. 6308 . . .	. .	26 1.41	3.936	7.6	1	123 3 18.2	2.27	7.6	1
521	B. A. C. 6317 . . .	. .	18 27 23.08	+ 3.933	7.5	1	122 59 5.3	− 2.39	7.5	1
522	O. Arg. S. 18436 . .	. .	29 14.83	3.772	7.4	1	117 49 41.8	2.55	7.4	1
523	Anonymous . . .	9.5	29 33.86	3.759	7.4	2	117 23 23.1	2.58	7.4	2
524	B. A. C. 6344 . . .	. .	31 26.82	3.935	7.6	2	123 5 58.8	2.74	7.6	2
525	B. A. C. 6487 . . .	. .	54 2.40	2.726	7.1	1	75 5 49.6	4.68	7.1	1
526	B. A. C. 6491 . . .	. .	18 54 20.63	+ 2.244	7.1	1	57 28 41.8	− 4.71	7.1	1
527	B. A. C. 6520 . . .	5.8	57 57.65	1.695	7.6	1	43 14 19.5	5.02	7.6	1
528	Durch. 21°, 3702 . .	. .	19 8 52.32	2.577	7.5	1	68 49 9.3	5.94	7.5	1
529	B. A. C. 6681 . . .	6.8	23 33.26	1.090	7.5	1	32 13 12.7	7.15	7.5	1
530	B. A. C. 6690 . . .	3.0	25 45.63	2.419	7.5	4	62 17 51.6	7.33	7.4	6
531	B. A. C. 6690 (Ref.) .	. .	. . . . .	. .	. .	.	62 17 52.5	− 7.33	7.3	2
532	B. A. C. 6691 . . .	7.0	19 26 47.75	+ 2.420	7.6	1	62 17 32.4	7.33	7.6	1
533	Anonymous . . .	. .	27 55.91	3.694	7.5	1	116 39 57.8	7.50	7.5	1
534	Mural Zones 176, 77 .	. .	28 20.09	3.690	7.5	1	116 34 6.8	7.54	7.5	1
535	Anonymous . . .	10.2	30 1.85	3.688	7.6	1	116 31 12.5	7.67	7.6	1
536	Anonymous . . .	9.8	19 30 52.72	+ 3.690	7.6	1	116 38 23.7	− 7.75	7.6	1
537	B. A. C. 6734 . . .	. .	33 8.59	1.612	7.7	3	40 3 46.2	7.92	7.7	3
538	B. A. C. 6734 (Ref.) .	. .	. . . .	. .	. .	.	40 3 48.3	7.92	7.1	1
539	B. A. C. 6763^1 . . .	6.2	38 32.78	1.612	7.6	2	39 45 34.4	8.36	7.6	2
540	B. A. C. 6763^2 . . .	6.5	38 35.56	1.612	7.6	2	39 46 1.6	8.36	7.6	2
541	B. A. C. 6905 . . .	. .	20 0.2 . .	+ 0.648	. .	.	25 31 24.0	− 10.04	7.7	1
542	B. A. C. 6905 (Ref.) .	. .	. . . .	. .	. .	.	25 31 24.4	10.04	7.7	1
543	B. A. C. 6930 . . .	6.0	3 11.70	0.765	7.7	1	26 27 48.8	10.27	7.7	1
544	Anonymous . . .	11.5	4 49.17	3.666	7.6	1	117 25 33.5	10.39	7.6	1
545	B. A. C. 6934 . . .	. .	4 57.53	3.096	7.1	1	91 11 4.1	10.40	7.1	1

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			h. m. s.	s.			° ′ ″	″		
546	O. Arg. S. 20345	. .	20 8 28.19	+ 3.379	7.7	5	105 9 15.6	− 10.66	7.7	5
547	O. Arg. S. 20392	. .	12 8.86	3.365	7.7	3	104 40 24.3	10.93	7.7	4
548	O. Arg. S. 20407	. .	12 57.82	3.380	7.8	2	105 24 1.8	10.99	7.8	2
549	Lalande 39140	. .	16 33.22	3.361	7.7	4	104 38 57.7	11.26	7.7	4
550	γ Cygni	. .	17 48.92	2.151	7.1	4	50 8 10.1	11.34	7.1	4
551	Lalande 39210	. .	20 18 24.72	+ 3.371	7.8	3	105 12 58.1	− 11.39	7.8	4
552	B. A. C. 7029	. .	19.0 . .	2.391	. .	.	58 12 22.7	11.43	7.5	1
553	B. A. C. 7029 (Ref.)	. .	. . .	. .	. .	.	58 12 22.2	11.43	7.5	1
554	Lalande 39247	. .	19 10.11	3.374	7.7	2	105 22 45.8	11.44	7.7	3
555	O. Arg. S. 20541	. .	22 8.52	3.373	7.8	1	105 27 59.3	11.65	7.8	2
556	Lalande 39486	. .	20 25 2.03	+ 3.344	7.7	3	104 11 21.9	− 11.86	7.8	4
557	B. A. C. 7077	6.5	25 32.86	3.582	7.5	2	115 21 27.7	11.89	7.5	2
558	Anonymous	10.0	25 49.07	3.582	7.5	1	115 24 23.2	11.91	7.5	1
559	Anonymous	10.0	26 52.87	3.582	7.5	1	115 27 32.0	11.99	7.5	1
560	Lalande 39579	. .	27 21.03	3.342	7.8	2	104 8 32.0	12.03	7.8	2
561	Weisse 664	. .	20 27 53.52	+ 3.356	7.8	2	104 51 43.6	− 12.06	7.8	3
562	Lalande 39671[1]	8.5	29 24.48	3.371	7.7	4	105 44 1.6	12.17	7.7	5
563	Lalande 39671[2]	9.2	29 24.64	3.371	7.7	4	105 43 58.2	12.17	7.7	5
564	B. A. C. 7149	. .	33 55.51	2.782	7.2	1	74 31 14.3	12.48	7.2	1
565	γ^1 Delphini	5.0	40 56.27	2.785	7.5	3	74 19 4.6	12.95	7.5	3
566	γ^2 Delphini	4.0	20 40 57.08	+ 2.785	7.5	3	74 19 5.3	− 12.96	7.5	3
567	B. A. C. 7220	. .	42 47.18	2.886	7.6	2	28 38 18.4	13.08	7.7	3
568	B. A. C. 7220 (Ref.)	. .	. . .	. .	. .	.	28 38 19.3	13.08	7.7	3
569	B. A. C. 7326	. .	59 15.82	2.243	7.7	1	48 51 27.6	14.14	7.7	1
570	61^2 Cygni	. .	21 1 24.76	2.334	7.5	4	51 51 23.8	14.28	7.6	5
571	Mural Zones 187, 66	8.8	21 6 58.30	+ 3.416	7.5	1	110 35 38.2	− 14.61	7.5	1
572	O. Arg. S. 21237	8.5	7 58.01	3.414	7.5	1	110 34 43.7	14.67	7.5	1
573	ι Capricorni	. .	15 23.80	+ 3.347	7.9	1	107 21 27.0	15.10	7.9	1
574	B. A. C. 7504	7.8	23 52.36	−10.757	7.8	2	3 28 31.3	15.58	7.8	2
575	Weisse (2) 1236	6.2	47 50.14	+ 2.820	7.8	2	70 54 39.6	16.81	7.8	2
576	B. A. C. 7643	5.5	21 50.7 . .	+ 1.011	. .	.	33 58 14.5	− 16.95	7.8	2
577	B. A. C. 7643 (Ref.)	. .	. . .	. .	. .	.	33 58 15.4	16.95	7.8	2
578	O. Arg. N. 23109	6.5	52 20.33	2.285	7.9	3	41 54 56.8	17.02	7.9	3
579	B. A. C. 7679	7.5	57 41.39	2.455	7.8	1	47 46 43.4	17.27	7.8	1
580	B. A. C. 7727	6.5	22 3 49.31	2.368	7.9	3	42 40 3.9	17.53	7.9	3
581	Groombridge 3699	7.2	22 5 41.05	+ 2.378	7.9	3	42 41 26.7	− 17.61	7.9	3
582	B. A. C. 7743	. .	5 56 96	2.488	7.8	2	47 34 27.4	17.62	7.8	2
583	Weisse (2) 175	8.5	8 25.90	2.876	7.8	2	72 35 21.1	17.72	7.8	2
584	B. A. C. 7770	. .	9 34.50	2.507	7.8	2	47 39 20.5	17.77	7.8	2
585	Durch. 22°, 4614	9.2	13 16.47	2.818	7.8	1	67 6 21.7	17.92	7.8	1

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.	Mean N. P. Distance, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
586	Lalande 43567	. .	22 13 53.08	+ 3.234	7.8	2	105 10 18.3	−17.94	7.8	2
587	Lalande 43596	. .	14 56.86	3.230	7.8	2	105 4 31.8	17.98	7.8	2
588	Transit Zones 205, 40	. .	16 43.90	3.234	7.7	1	105 33 58.9	18.05	7.7	1
589	50 Aquarii	5.8	17 51.77	3.217	7.8	13	104 9 7.4	18.10	7.8	14
590	Transit Zones 204, 17	. .	19 23.31	3.231	7.7	1	105 34 33.7	18.15	7.7	1
591	Weisse (2) 467	6.0	22 22 3.15	+ 2.621	7.9	1	50 48 58.9	−18.25	7.9	1
592	Piazzi XXII, 108	. .	22 24.31	+ 3.612	7.7	1	134 22 44.6	18.26	7.7	1
593	B. A. C. 7851	. .	22 48.40	− 3.893	7.1	1	4 30.8 . .	18.28	. .	.
594	B. A. C. 7851, S. P.	5.2	22 49.55	− 3.893	7.2	2	355 29 17.4	18.28	7.2	2
595	σ Aquarii	5.0	24 8.31	+ 3.180	7.8	13	101 18 23.9	18.32	7.8	14
596	Weisse (2) 698	. .	22 31 36.74	+ 2.604	7.7	1	47 2 13.9	−18.58	7.7	1
597	Weisse (2) 710	. .	31 57.12	2.603	7.8	1	46 56 26.8	18.59	7.8	1
598	Weisse (2) 715	. .	32 5.42	2.606	7.7	1	47 0 34.6	18.60	7.7	1
599	64 Aquarii	6.8	32 47.72	3.165	7.8	14	100 40 1.7	18.62	7.8	17
600	Weisse 709	. .	34 46.97	2.952	7.6	1	76 5 49.6	18.69	7.6	1
601	B. A. C. 7923	. .	22 37.2 . .	+ 2.804	. .	.	60 25 17.4	−18.76	7.8	1
602	B. A. C. 7923 (Ref.)	. .	. . . . .	. .	. .	.	60 25 17.5	18.76	7.8	1
603	B. A. C. 7931^1	9.8	38 32.01	2.698	7.7	3	51 10 43.2	18.80	7.7	3
604	B. A. C. 7931^2	8.5	38 32.24	2.698	7.8	4	51 10 43.8	18.80	7.8	4
605	70 Aquarii	6.2	42 1.88	3.160	7.8	12	101 12 16.7	18.90	7.8	15
606	74 Aquarii	. .	22 47 0.13	+ 3.163	7.6	8	102 16 13.2	−19.05	7.6	10
607	Weisse 966	. .	47 37.92	3.167	7.8	3	102 50 34.7	19.06	7.8	3
608	Weisse 1047	9.5	51 39.66	3.154	7.9	3	101 47 21.9	19.17	7.9	3
609	B. A. C. 8004	. .	53 7.04	3.166	7.7	2	103 43 47.0	19.20	7.7	3
610	B. A. C. 8013	. .	55 7.19	2.447	7.9	1	30 50 40.6	19.25	7.9	1
611	Weisse 1156	8.0	22 56 5.69	+ 3.150	7.9	3	101 55 36.0	−19.28	7.9	3
612	B. A. C. 8032	. .	57 46.90	2.886	7.1	1	62 35 3.6	19.32	7.1	2
613	B. A. C. 8032 (Ref.)	. .	. . .	. .	. .	.	62 35 1.6	19.32	7.1	1
614	Weisse 1204	8.0	58 3.06	3.153	7.9	3	102 50 28.8	19.33	7.9	3
615	h^1 Aquarii	. .	58 44.98	3.124	7.6	6	98 21 27.0	19.34	7.6	7
616	Weisse 1232	8.0	22 59 27.98	+ 3.142	7.9	3	101 6 5.2	−19.36	7.9	3
617	Weisse 1241	7.2	59 51.42	3.135	7.8	11	100 16 4.8	19.37	7.8	13
618	Weisse 1249	8.0	23 0 31.71	3.154	7.9	3	103 23 28.4	19.38	7.9	3
619	Weisse 1261	7.8	0 57.96	3.147	7.9	3	102 28 17.1	19.39	7.9	3
620	Weisse 49	9.0	5 4.04	3.135	7.9	3	101 10 34.4	19.48	7.9	3
621	Weisse 57^1	8.2	23 5 33.50	+ 3.142	7.9	3	102 36 2.0	−19.49	7.9	3
622	Weisse 57^2	8.2	5 33.80	3.142	7.9	3	102 36 2.9	19.49	7.9	3
623	Weisse 76	7.2	6 34.04	3.128	7.7	17	100 14 19.3	19.51	7.7	20
624	Weisse 123	7.0	8 15.64	3.132	7.9	3	101 21 26.6	19.55	7.9	3
625	Lalande 45504	8.0	8 55.98	3.136	7.9	3	102 14 6.6	19.56	7.9	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.	Mean N. P. Distance, 1877.0.	Annual Precession, 1877.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
626	ψ^1 Aquarii	. .	23 9 26.90	+ 3.122	7.8	3	99 45 28.2	−19.57	7.8	3
627	Weisse 185	. .	11 14.84	3.134	7.9	3	102 23 4.4	19.60	7.9	3
628	ψ^2 Aquarii	4.8	11 30.69	3.121	7.7	16	99 51 14.0	19.61	7.7	19
629	Durch. 62°, 2208 . .	. .	11 59.31	2.539	7.8	1	27 32 4.0	19.62	7.8	1
630	Anonymous . . .	. .	12 32.69	2.543	7.8	1	27 28 46.4	19.63	7.8	1
631	ψ^3 Aquarii	5.4	23 12 33.84	+ 3.122	7.9	3	100 17 0.0	−19.63	7.9	3
632	Weisse 228	8.2	12 37.13	3.135	7.9	3	102 50 33.8	19.63	7.9	3
633	Weisse 265	8.0	14 28.72	3.124	7.9	3	101 12 21.4	19.66	7.9	3
634	97 Aquarii	5.2	16 12.35	3.143	7.8	11	105 42 50.9	19.69	7.8	12
635	Weisse 309	8.0	16 37.67	3.123	7.9	3	101 26 52.8	19.70	7.9	3
636	Weisse 315	8.5	23 16 54.46	+ 3.116	7.9	3	100 3 34.6	−19.70	7.9	4
637	Anonymous . . .	10.8	20 10.68	3.102	7.6	1	97 34 35.6	19.75	7.6	1
638	Weisse 377	. .	20 13.48	3.116	7.9	2	100 42 38.4	19.75	7.9	3
639	Weisse 394	. .	21 2.24	3.127	7.7	2	103 36 21.4	19.77	7.7	2
640	Weisse 402	7.0	21 41.20	3.120	7.9	3	102 7 34.6	19.77	7.9	3
641	Weisse 427	6.8	23 22 38.96	+ 3.110	7.9	4	99 56 34.5	−19.80	7.9	4
642	B. A. C. 8199 . . .	. .	25 50.03	3.115	7.7	2	102 13 22.7	19.83	7.7	2
643	Weisse 497	7.5	26 3.51	+ 3.113	7.8	3	101 40 40.2	19.84	7.8	3
644	B. A. C. 8213 . . .	5.8	27 50.19	− 0.110	7.9	1	3 22 16.4	19.86	7.9	1
645	B. A. C. 8213, S. P. .	. .	27 50.79	− 0.110	7.1	1	356 37 43.3	19.86	7.1	1
646	Weisse 571	7.5	23 29 5.83	+ 3.108	7.9	3	101 14 6.6	−19.87	7.9	3
647	Weisse 586	. .	29 39.44	3.101	7.9	3	99 26 42.7	19.88	7.9	3
648	B. A. C. 8221 . . .	. .	31 16.94	3.113	7.7	2	103 44 30.2	19.90	7.7	2
649	Weisse 629	. .	31 51.43	3.099	7.8	3	99 18 30.2	19.99	7.8	3
650	B. A. C. 8229 . . .	4.0	32 6.46	2.923	7.8	2	47 24 45.2	19.91	7.8	2
651	B A. C. 8239 . . .	. .	23 34 46.98	+ 3.104	7.6	6	102 21 46.4	−19.93	7.6	7
652	B. A. C. 8245 . . .	. .	36 11.59	2.936	7.9	3	45 41 23.4	19.95	7.9	3
653	B. A. C. 8266 . . .	6.2	40 55.88	3.097	7.6	8	102 35 29.4	19.98	7.6	9
654	B. A. C. 8268 . . .	. .	41 3.02	2.896	7.7	4	32 1 59.6	19.98	7.8	5
655	B. A. C. 8268 (Ref.) .	. .	. . .	. .	. .	.	32 1 59.4	19.98	7.9	3
656	Anonymous . . .	8.9	23 41 30.50	+ 3.083	7.9	3	95 36 48.6	−19.99	7.9	3
657	Anonymous . . .	10.2	43 18.02	3.095	7.9	3	103 1 44.1	20.00	7.9	3
658	B. A. C. 8285 . . .	6.5	43 53.92	3.090	7.6	5	100 39 39.1	20.00	7.6	7
659	O. Arg. N. 26144 . .	9.0	47 40.15	2.866	7.8	3	19 11 36.7	20.03	7.8	3
660	Weisse 985	. .	49 26.69	3.087	7.6	4	103 50 6.2	20.03	7.6	7
661	Weisse (2) 1027 . .	6.2	23 50 25.59	+ 3.049	7.8	3	68 2 11.0	−20.04	7.8	3
662	Durch. 70°, 1340 . .	9.8	54 29.41	2.980	7.9	4	19 9 6.5	20.05	7.9	4
663	Weisse 1114 . . .	. .	55 31.26	3.074	8.0	2	93 42 44.2	20.05	8.0	2
664	Σ 3052^1	. .	56 38.37	3.015	7.9	3	19 19 33.0	20.05	7.9	3
665	Σ 3052^2	. .	56 39.39	3.017	7.9	3	19 18 59.9	20.05	7.9	3
666	B. A. C. 8359 . . .	. .	23 57 54.25	+ 3.049	7.9	3	28 23 50.5	−20.05	7.9	3

METEOROLOGICAL OBSERVATIONS

MADE AT THE

UNITED STATES NAVAL OBSERVATORY

DURING

THE YEAR 1877.

INTRODUCTION.

The meteorological department, during 1877, was under the charge of Professor J. R. **Eastman**, U. S. N., who made a daily examination of all the records and a monthly inspection of all the instruments in use The observations were made at 0^h, 3^h, 6^h, 9^h, 12^h, 15^h, 18^h, and 21^h, Washington civil time, by the Observatory watchmen, Messrs T. **Hays**, D. **Horrigan**, and N. **Cahill**, who have acquired such a degree of skill as insures a reasonable accuracy in their work.

METEOROLOGICAL INSTRUMENTS.

Standard Barometer.—The barometer was made by **James Green**, of New York, and is used only as a standard by which the Newman barometer is occasionally tested Drawings and description of this instrument will be found in the volume of Washington Observations for 1862.

Newman Barometer.—This barometer, in daily use, was made by **Newman**, and is mounted against the northern wall of the northwest room on the first floor of the Observatory. The barometer is mounted with the usual adjustments at the top and bottom, and is attached by heavy brackets to a substantial mahogany board, which is firmly secured to the wall. The cistern is 103 feet above the mean half-tide of the Potomac River. The cistern and tube are of glass; the internal diameter of the former being 3.0 inches, and of the latter 0.532 inch.

The scale is attached to a brass rod having the usual adjustment to the surface of the mercury in the cistern. It is silvered and divided to 0.05 inch, and by means of a vernier may be read to 0.002 inch. The temperature of the mercury in the cistern is determined by a small ivory-scale thermometer, the bulb of which is constantly immersed in the mercury. The observations with this instrument in 1877, as printed in this volume, have received the constant correction of +0.005 inch, determined in 1864, and have also been reduced to 32°.0 Fahrenheit.

Dry-bulb Thermometer.—This is a mercurial thermometer by **Green**, with a bulb 1.5 inches long and 0.2 inch in diameter. The scale is of glass, 12.0 inches long, 0.8 inch wide, and 0.1 inch thick. It is divided to half-degrees from —30° 0 to +125°.0 Fahrenheit. Several independent tests, in the spring of 1868, indicated that the *freezing-point* had changed its position on the scale since 1863.

In 1871, the dry-bulb, the maximum, and the minimum thermometers were compared with the Kew standard thermometer, No. 462, belonging to Professor **Eastman**. No appreciable errors were detected in the maximum and minimum thermometers. A correction of —0°.9 was deduced for the dry-bulb thermometer, and in 1876 this correction was found to be — 1°.0, and each observation published in this volume has been corrected by the latter quantity.

Wet-bulb Thermometer.—This instrument is similar to the preceding in materials, construction, and dimensions. Its scale extends from —35°.0 to + 115°.0 Fahrenheit. The bulb is covered with soft, fine linen, kept moist by the capillary action of a bundle of fine linen fibers that communicate with water in a bird-glass placed close beside it. The linen on the bulb is changed before its free action is impaired by dust.

Maximum Thermometer.—This is a mercurial thermometer, with a bulb 1.5 inches long and 0 2 inch in diameter. The scale is of glass, 12.0 inches long, 0.8 inch wide, and 0.1 inch thick, and is graduated to half-degrees from — 50°.0 to + 120°.0 Fahrenheit. At a point a short distance above the bulb, the internal diameter of the tube is so reduced that, while with the increase of temperature the mercury passes freely, with the least decrease of temperature the column of mercury is broken at the point of contraction if the instrument is nearly horizontal, and the top of the column marks the highest temperature.

The top of the scale is attached by a metallic clamp to a pivot, around which the thermometer revolves freely in a vertical plane. This pivot is secured to a walnut board fixed to a post, about three feet above the ground; and the thermometer is placed nearly horizontal by resting the scale near the bulb on a wooden pin in the board.

After each observation, the instrument is adjusted by removing the pin and allowing the thermometer to swing freely from the pivot at the top of the scale, which motion is generally sufficient to reunite the column of mercury. In 1873, it was found that the readings from this thermometer required a correction of +0°.5, which has been applied to the observations of 1877

Minimum Thermometer.—This is a transparent spirit-thermometer, with a spherical bulb about 0.5 inch in diameter. The scale is of silvered brass, 12 inches long, 1.0 inch wide, and 0.06 inch thick, and is graduated to degrees from — 67°.0 to + 131°.0 Fahrenheit. The registering index is a short, fine steel wire, inclosed in a delicate blue-glass cylinder, with a small knob at the extremity farthest from the bulb of the thermometer.

This cylinder is drawn toward the bulb by the decrease of temperature; but when the temperature increases, the spirit flows through and around the cylinder, which remains at rest at the lowest point reached by the liquid. The end of the knob on the cylinder indicates the lowest point reached by the column of liquid. After each observation, the index is moved to the top of the column by means of a small magnet.

Solar Thermometer.—This thermometer (No. 13583) was made by L. **Casella**, of London, and consists of a blackened spherical bulb and its tube, inclosed within a bulb and cylinder of glass of the same form as the thermometer, but of about three times the diameter. The air has been exhausted from the inclosing bulb and cylinder, and the thermometer is confined in the center of the cylinder by having its upper end sealed to the end of the cylinder, while the lower end is fixed in a cork collar just above the junction of the bulb and cylinder. The scale is engraved on the thermometer-tube to degrees, and has a range from — 10°.0 to + 215°.0 Fahrenheit.

At about 20° from the top of the column of mercury, a small portion of air (covering about 0°.5 on the scale) is introduced into the column, so that whenever the temperature diminishes, the column of mercury above the air remains in position, indicating the highest temperature subsequent to the last observation. After each observation, the instrument is adjusted by holding it in a vertical position, tapping it gently, if necessary, until the upper portion forces the air down to the main column.

This thermometer rests in a horizontal position, in metallic crutches, 3 inches high, which are attached to an inch board 16 inches long and 5 inches wide. The board is painted green, and placed on the grass about three yards west of the Meteorological Observatory.

METEOROLOGICAL OBSERVATORY.

In 1862, a small building for the special protection of thermometers was erected about four yards southwest of the southwest corner of the south wing of the Observatory. It is constructed of wood, and painted white throughout.

Its form is octagonal, each side being 2.4 feet wide and 6.3 feet high to the eaves. The roof is of tin, unpainted on the under side. The ceiling is of thick boards, tightly fitted together, and between it and the roof there is an open space freely communicating with the open air.

On the north side is the door, which, as well as the sides, is of double louver-work, with a space of three inches between the two divisions. The sides terminate one foot from the ground, and, as the building is situated on a grass-plat, under ordinary circumstances the instrument should indicate the true temperature. This building was moved on April 9, 1874, to a point 18.8 yards west of the south wing of the main building and 17.3 yards south of the Transit Circle room.

The dry-, wet-bulb, maximum, and minimum thermometers are in the Meteorological Observatory, and are all supported by means of arms and brackets to an upright metallic shaft, which is firmly secured to the ground in the center of the building.

The bulb of the minimum thermometer is 5.8 feet, those of the dry- and the wet-bulb thermometers are 4.2 feet, and that of the maximum thermometer is 3.2 feet above the ground.

A standard thermometer (TROUGHTON & SIMMS, No. 1) is suspended between the dry- and the wet-bulb thermometers, and is frequently used as a check on the other instruments.

From frequent comparisons, it has been ascertained that the errors of the minimum and wet-bulb thermometers are not appreciable, and therefore the published observations with these instruments are from the unmodified copies of the original records.

The maximum and minimum thermometers were read at the end (midnight) of each day.

DIRECTION AND FORCE OF THE WIND.

An ordinary wind-vane revolves freely on a spindle at the top o
staff, and the direction of the wind is estimated from the known azim

of the main building of the Observatory. The velocity of the wind is recorded in numerals, of which 0 indicates a calm, 1 a very slight breeze, and so on up to 10, which would indicate a violent hurricane.

These recorded numbers are only estimates, and at best are but approximative.

CLOUDS.

In the description of the prevailing forms of clouds, the nomenclature of HOWARD is used: C, K., S., N., being the symbols for the forms designated *cirrus*, *cumulus*, *stratus*, *nimbus*; and the letters C. S., C. K., etc., indicate the combination *cirro-stratus*, *cirro-cumulus*, etc The portion of the sky obscured is determined by estimation after a careful scrutiny of the clouds or sky. A clear sky is denoted by 0, and a total obscuration by 10.

RAIN-GAUGE.

This instrument is placed within the inclosure for the protection of the solar thermometer. It consists of a cylinder 0.8 inch long and 4.1 inches in diameter, soldered to an inverted cone, which is loaded with lead on the outside and near the apex.

The cone rests in an aperture in the horizontal top of an oblong box, and this, aided by the weight of the lead, prevents any disturbance, even during high winds. The top of the gauge is 2.0 feet above the ground, and is free from all shelter, even in driving rain-storms.

At the apex of the cone is a small aperture, through which the water passes to a receiving-bottle in the box.

The rain is measured in a glass cylinder, with an internal diameter of 0.60 inch, so graduated that the depth of rain can be determined to within 0.002 inch.

The gauge is examined every day, and, as the apex of the cone closes the mouth of the bottle except through the small aperture, there is little or no loss by evaporation.

Each inch of snow is assumed to be equal to 0.111 inch of rain; but, whenever practicable, the snow has been melted, and measured in the graduated cylinder.

RESULTS OF THE OBSERVATIONS IN 1877.

In previous years all of the meteorological observations have been published in full. It has been deemed unadvisable to continue that system of publication, and in this volume the matter published is confined principally to the results deduced from the observations.

EXPLANATION OF THE TABLES.

TABLE I.—Contains the mean of the *eight* observations on each day, corrected for temperature and for error of scale.

TABLE II.—Contains the maximum and minimum corrected readings from the daily record of observations.

TABLE III.—Contains the mean of the *eight* observations on each day, corrected for error of scale.

TABLE IV.—Contains the observations with the maximum and minimum thermometers, together with the mean results.

TABLE V.—The quantities in this table are collated from TABLE IV.

TABLE VI.—Contains the mean of the *eight* observations of cloudiness and force of wind (see page 6 of this Introduction), together with the amount of rain or snow, and such explanatory remarks as were entered in the observing-book.

TABLE VII.—Contains the amount of rain and snow for each month and for the year. The depth of snow is measured only when the snow is dry, but the second column contains the amount of melted snow measured as rain.

TABLE VIII.—Contains the monthly and annual means of the corrected readings of the barometer, and the dry, wet, and sun thermometers at the hours of observation.

TABLE IX.—Is a condensed monthly and annual exhibit of the direction of the wind at the hours of observation.

TABLE X.—Is a condensed monthly and annual exhibit of the kinds of clouds prevailing at the hours of observation.

TABLE I.—*Daily Mean of the Corrected Readings of the Barometer in* 1877.

Day.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	29.936	30.077	30.137	30.158	29.805	30.065	29.763	30.003	29.719	30.105	29.954	30.074
2	29.782	29.964	29.663	29.970	29.838	30.022	29.872	29.951	29.719	30.016	29.555	30.334
3	30.109	30.095	29.789	30.122	29.856	29.896	29.830	29.822	29.851	29.900	29.945	30.371
4	30.113	30.275	29.806	29.975	29.706	29.863	29.910	29.872	29.986	29.483	30.248	30.209
5	30.221	30.059	30.123	29.754	29.841	29.742	29.923	29.928	30.022	29.815	29.994	29.801
6	30.052	29.998	30.133	29.808	29.865	29.542	29.805	29.846	30.029	30.228	30.100	29.800
7	29.505	29.927	30.053	29.934	29.814	29.699	29.970	29.723	29.924	30.352	30.406	30.214
8	29.710	30.027	29.800	29.848	29.660	29.886	29.965	29.675	29.985	30.078	30.014	30.107
9	30.200	30.071	29.423	29.719	29.713	29.829	29.761	29.612	30.033	30.036	29.680	30.291
10	30.185	30.119	30.235	29.821	29.889	29.774	29.685	29.717	29.993	30.017	30.069	30.167
11	30.134	30.209	30.436	29.869	30.143	30.001	29.799	29.951	29.979	29.933	30.192	30.050
12	30.157	30.101	30.165	29.919	30.269	30.115	29.953	29.915	30.049	30.039	30.165	30.195
13	29.960	30.419	29.962	30.050	30.262	30.137	29.927	29.799	30.019	30.158	30.207	29.901
14	29.968	30.466	29.893	29.918	30.243	30.095	29.937	29.753	29.966	30.191	30.301	30.254
15	29.901	30.315	29.849	29.986	30.157	30.053	29.918	29.720	29.912	30.186	30.173	30.152
16	29.808	30.018	29.873	29.944	29.991	29.907	29.838	29.735	29.949	30.049	30.053	30.084
17	30.427	29.900	29.929	29.873	29.955	29.945	29.810	29.813	29.830	30.062	29.989	30.107
18	30.415	29.984	30.059	29.819	29.964	29.990	29.819	29.906	29.927	29.969	30.042	30.360
19	30.153	29.659	30.036	29.593	29.891	29.879	29.660	29.939	30.035	29.924	30.203	30.342
20	29.666	29.955	30.157	29.449	29.768	29.999	29.726	29.913	29.945	29.811	30.424	30.233
21	30.109	29.835	29.851	29.883	29.632	29.817	29.890	29.931	29.920	29.607	30.399	30.449
22	30.222	29.837	29.864	30.161	29.527	29.780	30.041	29.952	30.185	29.651	30.180	30.425
23	30.256	29.676	29.797	30.155	29.687	30.044	30.146	29.942	30.218	30.030	30.069	30.405
24	30.049	29.467	29.927	29.897	29.822	29.871	30.086	29.911	30.165	30.031	29.743	30.263
25	30.264	29.765	29.995	29.924	29.913	29.799	29.923	29.933	30.133	29.886	29.715	30.023
26	30.240	30.077	29.526	30.020	29.983	29.791	29.861	29.998	30.080	29.768	29.575	29.862
27	30.038	30.188	29.355	29.948	30.090	29.836	29.911	30.103	30.043	29.885	29.783	29.843
28	30.250	30.107	29.514	29.742	30.201	29.949	29.921	30.102	30.016	30.075	29.954	30.003
29	30.164	. .	29.718	29.695	30.161	30.014	29.787	29.974	29.963	30.031	29.753	29.902
30	30.346	. .	30.097	29.755	30.036	29.941	29.763	29.920	30.079	29.965	29.890	29.358
31	30.338	. .	30.294	. .	29.983	. .	29.899	29.896	. .	29.801	. .	29.532
Mean .	30.088	30.021	29.918	29.888	29.931	29.909	29.874	29.879	29.989	29.970	30.029	30.100

	in.
Mean barometric pressure for the year	29.966
Maximum mean daily pressure	30.471
Minimum mean daily pressure	29.360
Range during the year	1.111

TABLE II.—*Maximum and Minimum Corrected Readings of the Barometer at the hours of observation for each month in* 1877.

Month.	Maximum.		Minimum.		Range.
	Day and hour.	Reading.	Day and hour.	Reading.	
		in.		in.	in.
January	17, 3 p. m.	30.510	7, 6 a. m.	29.263	1.247
February	14, 9 a. m.	30.520	24, 3 a. m.	29.338	1.182
March	11, 9 a. m.	30.524	9, 6 a. m.	29.084	1.440
April	23, 9 a. m.	30.239	20, 3 a. m.	29.361	0.878
May	13, 9 a. m.	30.298	22, 3 p. m.	29.404	0.894
June	13, 9 a. m.	30.184	6, 3 p. m.	29.505	0.679
July	23, 9 a. m.	30.168	19, 3 p. m.	29.636	0.532
August	27, 9 a. m.	30.150	9, 6 p. m.	29.611	0.539
September	23, 9 a. m.	30.262	1, 3 p. m.	29.661	0.601
October	7, 9 a. m.	30.413	4, 3 p. m.	29.199	1.214
November	21, 0	30.471	2, Noon	29.312	1.159
December	21, 9 a. m.	30.502	30, 3 p. m.	29.266	1.236

	in.
Maximum for the year	30.524
Minimum for the year	29.084
Range for the year	1.440
Mean monthly range	0.967

TABLE III.—*Mean Daily Temperature from the Dry-Bulb Thermometer in* 1877.

Day.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	°	°	°	°	°	°	°	°	°	°	°	°
1	17.0	47.7	39.4	52.4	46.9	70.7	81.2	73.9	77.4	64.2	48.0	28.8
2	18.1	47.3	43.8	53.1	45.4	73.6	77.6	71.1	69.1	66.2	55.8	31.3
3	7.8	43.6	47.0	41.3	47.4	73.0	71.9	75.6	63.4	67.1	46.8	31.2
4	8.0	38.3	45.5	42.1	54.1	71.7	73.8	73.8	66.2	67.5	42.8	35.6
5	11.1	36.8	33.2	41.5	52.7	70.5	72.6	70.1	68.1	55.2	46.8	48.8
6	22.2	39.4	33.5	48.5	49.6	68.4	72.9	72.3	65.8	51.9	40.5	40.7
7	36.0	40.7	41.3	50.8	51.4	68.0	72.8	75.8	62.9	52.0	36.8	36.3
8	30.2	37.1	51.7	42.7	48.1	72.4	75.1	76.5	59.7	56.4	46.9	36.9
9	15.5	34.8	45.5	42.8	48.7	71.7	78.5	74.5	63.2	58.1	59.2	33.2
10	16.7	33.8	26.2	47.4	50.8	69.3	78.4	74.9	65.1	57.1	43.1	34.8
11	23.5	40.0	32.0	50.8	52.8	63.7	73.7	72.8	67.9	55.3	37.8	42.1
12	33.6	43.2	43.6	52.1	55.5	64.9	73.0	76.2	70.1	51.2	40.7	43.4
13	33.9	28.6	46.4	41.2	54.4	72.1	72.3	73.0	70.2	51.0	42.3	46.7
14	29.4	29.2	41.4	45.0	61.3	75.6	71.8	75.2	73.1	56.6	44.7	39.9
15	32.0	32.8	35.5	48.2	65.3	75.7	76.9	73.0	74.8	61.6	54.1	38.0
16	39.8	40.5	36.9	53.6	70.6	74.4	79.5	72.0	74.4	64.1	57.3	49.8
17	32.8	34.8	28.6	56.8	74.3	76.8	79.4	72.1	73.2	64.0	51.0	47.2
18	31.6	33.9	24.0	56.4	77.4	77.2	78.1	72.8	63.8	60.6	45.8	44.2
19	33.9	34.9	23.7	55.7	78.2	80.0	75.4	74.0	60.0	65.1	38.0	41.6
20	41.2	30.4	27.1	58.3	77.3	76.4	73.1	72.7	61.3	68.0	37.1	48.1
21	32.2	40.5	39.9	51.1	75.6	75.5	75.4	74.6	62.5	60.5	36.7	45.2
22	28.6	42.9	43.4	56.8	69.4	69.9	76.3	75.2	57.8	51.5	45.6	44.2
23	26.8	41.5	50.4	60.0	64.7	64.7	76.2	73.5	59.2	51.2	53.5	46.5
24	27.0	37.1	52.9	64.5	52.4	69.2	79.3	77.0	63.3	55.7	57.6	43.9
25	23.7	39.7	51.7	62.7	54.5	76.8	81.3	75.7	66.3	56.3	54.6	44.6
26	26.2	35.4	47.6	54.4	58.7	79.6	83.1	74.8	68.6	55.9	53.0	42.6
27	33.5	37.6	42.7	50.3	61.7	76.1	82.7	76.3	69.3	49.3	46.9	45.2
28	34.6	38.2	40.0	53.0	63.3	66.2	79.6	79.2	70.6	55.3	45.6	42.6
29	36.2	. .	40.3	59.2	65.6	69.1	77.9	80.8	70.6	61.6	38.9	39.4
30	36.8	. .	43.4	58.6	66.9	74.7	80.8	79.7	66.8	54.9	25.9	36.8
31	37.7	. .	40.2	. .	67.7	. .	78.3	79.3	. .	52.3	. .	34.4
Mean .	27.7	37.9	39.9	51.7	60.1	72.4	76.7	74.8	66.8	58.0	45.8	40.8

Mean temperature for the year by dry-bulb thermometer. . . .	54°.5
Maximum mean daily temperature	83°.1
Minimum mean daily temperature	7°.8
Range	75 .3

TABLE IV.—*Temperature from the Maximum and Minimum Thermometers in* 1877.

Day.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1	21.0	11.2	65.0	36.0	56.5	24.6	67.5	41.0	54.5	37.0	87.0	54.2	92.0	70.8	81.0	67.6	90.7	66.5	80.5	50.0	61.0	35.0	41.0	17.2
2	26.0	+ 6.5	54.1	39.0	50.5	37.0	59.7	36.2	55.1	36.0	89.7	58.0	88.1	69.0	78.5	65.5	81.7	56.0	78.0	54.5	68.0	41.0	41.0	24.0
3	25.7	− 5.5	55.0	31.0	57.0	39.0	54.0	29.0	57.5	37.0	91.5	63.0	84.0	68.0	86.2	66.0	77.0	53.0	76.7	56.0	60.0	35.0	47.5	19.5
4	20.0	− 8.5	52.5	28.0	57.5	31.0	46.5	38.5	68.5	39.5	80.0	65.0	84.7	64.6	85.0	64.5	83.0	50.0	71.0	52.5	58.7	29.2	46.4	25.0
5	27.5	− 9.5	42.0	31.5	43.5	26.0	49.1	35.2	64.0	46.5	83.1	63.0	86.5	61.0	84.0	58.0	79.7	56.0	65.4	42.4	57.0	38.0	58.5	38.5
6	36.5	+ 7.0	51.0	31.0	44.7	23.0	64.0	34.5	56.5	42.0	81.0	60.0	83.5	64.0	88.0	58.0	68.0	63.0	67.0	40.0	53.0	28.0	53.0	34.5
7	45.3	28.5	59.0	25.5	54.5	30.0	66.0	35.0	66.5	37.0	78.7	58.8	85.0	60.2	87.3	65.0	66.5	57.0	67.0	37.5	52.9	24.0	47.0	28.9
8	38.5	18.0	49.4	27.2	66.5	39.5	49.0	36.2	51.0	43.5	86.0	57.8	88.0	62.0	87.5	66.0	64.1	52.8	66.8	49.5	64.5	32.0	53.5	27.0
9	29.0	6.5	49.5	24.5	60.3	22.0	49.0	40.0	57.5	40.0	86.0	66.0	90.5	65.0	80.8	67.0	76.5	49.0	71.1	46.5	70.0	47.0	53.0	25.0
10	26.1	7.0	48.0	21.5	38.3	17.5	62.0	37.0	65.5	39.5	74.5	57.5	86.7	69.0	87.9	63.0	79.0	52.0	73.5	43.5	51.3	32.6	50.9	21.2
11	38.0	10.0	60.5	24.0	46.5	19.5	67.0	34.5	65.8	40.0	73.0	55.5	85.0	66.5	87.0	60.0	72.1	62.6	66.3	45.2	51.1	31.0	62.1	29.5
12	38.0	29.0	66.1	26.8	59.0	32.0	67.0	35.0	67.5	45.2	76.5	56.5	83.7	61.2	89.7	62.0	77.0	66.0	66.5	41.0	58.0	27.0	60.5	30.5
13	41.0	28.5	40.0	21.0	52.5	40.5	47.5	35.0	65.5	43.0	84.7	61.0	86.7	60.0	85.0	68.0	75.0	66.5	67.0	39.5	62.7	27.2	61.0	35.5
14	38.1	19.2	43.7	17.0	47.5	37.0	58.5	34.0	75.0	47.6	86.1	65.4	84.5	59.0	87.0	67.0	84.1	64.3	73.5	42.2	62.5	28.0	49.5	28.5
15	35.5	29.0	48.0	20.5	44.5	25.2	67.0	30.0	81.1	48.0	86.0	65.0	90.0	63.5	83.8	64.5	85.0	67.0	77.5	42.6	68.5	40.0	56.5	25.0
16	52.7	32.0	52.5	29.9	47.0	26.0	68.5	39.0	88.0	56.0	78.5	68.6	92.2	67.2	84.5	61.0	85.0	66.5	80.5	50.0	69.1	41.0	65.1	36.2
17	38.5	29.5	43.5	25.0	36.5	21.0	66.0	47.5	88.5	58.0	86.7	66.0	90.5	71.0	85.0	60.0	87.1	63.5	70.0	50.5	66.5	39.0	61.5	33.8
18	35.7	27.6	48.0	32.0	36.0	11.2	65.0	47.5	92.9	61.5	87.5	67.0	88.5	68.0	86.7	61.0	74.5	54.0	76.0	48.5	53.5	34.5	49.5	37.0
19	37.0	31.5	40.5	28.0	28.5	17.0	65.5	48.0	91.5	64.5	94.5	67.0	81.1	70.4	89.5	59.0	71.5	52.0	80.0	55.0	49.7	27.8	53.1	32.5
20	59.0	32.4	43.5	20.0	42.0	14.0	69.7	44.8	90.7	66.0	87.0	67.2	78.5	67.8	89.0	61.0	69.1	51.5	78.7	60.5	53.0	28.0	67.7	34.8
21	43.0	28.0	61.9	25.5	50.0	30.0	60.0	39.0	89.1	64.5	89.5	65.0	86.0	67.0	89.7	61.0	76.5	49.0	63.5	55.0	48.5	28.0	50.0	39.5
22	32.9	20.6	64.0	25.0	50.5	35.5	73.0	41.0	84.5	62.0	75.5	57.5	87.1	68.5	88.5	63.0	72.5	43.5	59.5	40.0	52.4	39.0	48.7	39.0
23	36.7	18.0	47.0	35.0	70.0	35.0	78.0	41.6	74.0	51.0	76.0	49.0	83.5	70.0	85.0	65.0	77.0	43.0	70.0	35.9	58.5	47.5	52.0	39.0
24	36.2	17.0	46.5	32.0	72.5	35.5	83.5	45.0	62.5	43.0	81.5	56.0	89.0	71.5	86.7	69.3	80.0	48.2	74.5	40.8	62.0	53.0	52.5	40.0
25	35.0	13.5	49.1	31.5	62.5	41.0	72.5	49.5	69.5	40.0	90.0	68.0	92.7	71.5	88.0	66.0	82.5	53.5	74.0	43.0	58.5	47.6	47.7	40.3
26	42.1	11.0	41.5	30.5	56.0	43.0	62.0	44.5	73.9	45.8	94.5	66.0	96.5	70.0	89.0	63.5	82.7	55.0	63.0	47.5	62.5	45.5	45.7	38.6
27	53.5	19.5	46.1	28.5	46.5	42.0	53.0	47.0	74.0	49.0	88.5	66.5	98.2	72.0	91.0	68.2	82.0	58.0	58.5	45.0	55.5	39.0	50.5	38.0
28	43.5	24.5	51.5	26.5	49.5	31.0	58.5	50.0	79.5	49.0	70.5	59.0	95.3	71.7	94.0	66.0	78.0	64.5	60.5	49.0	55.5	34.0	56.0	31.2
29	53.5	24.0	. .	. .	51.5	31.0	66.5	52.0	80.8	50.0	80.0	59.5	91.0	71.5	96.0	67.0	81.9	62.2	77.1	49.5	55.0	26.0	49.5	28.8
30	55.0	24.0	. .	. .	58.5	31.0	67.5	52.0	82.3	50.5	87.5	60.0	92.5	72.5	91.1	69.0	79.5	56.0	59.5	48.5	55.0	19.0	45.5	35.0
31	54.0	25.0	. .	. .	50.0	39.0	. .	. .	84.5	51.0	. .	. .	88.1	69.0	90.6	69.0	. .	. .	60.0	40.0	. .	. .	42.1	25.5
Mean.	38.5	18.7	50.7	27.6	51.2	29.9	62.8	40.6	72.8	47.9	83.7	61.6	88.1	67.2	87.2	64.2	78.0	56.7	70.1	46.5	58.5	34.8	52.2	31.6
Mean temp.	28.6		39.2		40.5		51.7		60.3		72.7		77.6		75.7		67.4		58.3		46.6		41.9	

	°
Mean temperature for the year from the maximum and minimum thermometers .	55.1
Maximum temperature during the year	98.2
Minimum temperature during the year	− 9.5
Range during the year	107.7

TABLE V.—*Maximum and Minimum Temperatures for each month in* 1877.

Month.	Maximum.		Minimum.		Range.
	Day.	Reading.	Day.	Reading.	
		°		°	°
nuary	20	59.0	5	− 9.5	68.5
ebruary	12	66.1	14	+17.0	49.1
arch	24	72.5	18	11.2	61.3
pril	24	83.5	3	29.0	54.5
ay	18	92.9	2	36.0	56.9
une	26	94.5	23	49.0	45.5
uly	27	98.2	14	59.0	39.2
ugust	29	96.0	5, 6	58.0	38.0
ptember	1	90.7	23	43.0	47.7
tober	1, 16	80.5	23	35.9	44.6
vember	9	70.0	30	19.0	51.0
cember	20	67.7	1	17.2	50.5

TABLE VI.—*Clouds, Wind, and Weather in* 1877.

Date.		Mean cloudiness.	Mean force of wind.	Remarks.
1877. Jan.	1	8.8	1.2	Began to snow at noon; continued 13 hours; depth of snow, 12.5 inches.
	2	3.1	2.2	
	3	4.4	1.1	
	4	2.4	1.1	
	5	4.4	1.0	Rain and sleet from 3^h p. m. till after midnight; amount, 1.400 inch.
	6	9.9	1.1	
	7	5.1	1.6	
	8	5.6	1.9	
	9	2.9	1.4	
	10	6.0	1.0	
	11	7.8	1.1	
	12	10.0	1.0	Light rain in the evening; amount, 0.044 inch.
	13	8.1	1.4	
	14	7.0	1.1	
	15	10.0	1.0	Snow and rain during the day; amount, 0.294 inch.
	16	9.1	1.0	
	17	10.0	1.5	Rain and snow in the afternoon; depth of snow, 0.5 inch; amount of rain and snow, 0.150 inch.
	18	10.0	1.0	
	19	10.0	1.0	
	20	9.7	1.5	Rain during the day; amount, 0.500 inch.
	21	10.0	1.4	
	22	9.8	1.0	Rain and snow; depth of snow, 3.0 inches; melted snow and rain, 0.748 inch.
	23	9.2	1.0	
	24	6.6	2.0	
	25	1.4	1.2	
	26	0.0	1.0	
	27	2.0	1.0	
	28	1.3	1.0	
	29	2.2	1.0	
	30	2.3	1.0	
	31	6.2	1.0	
Feb.	1	8.1	1.0	
	2	6.0	1.0	Rain in the evening; amount, 0.090 inch.
	3	6.2	1.0	
	4	5.4	1.0	
	5	7.4	1.0	
	6	0.2	1.2	
	7	2.4	1.1	
	8	1.2	1.0	
	9	1.4	1.0	
	10	1.1	1.0	
	11	0.0	1.0	
	12	5.6	1.9	
	13	0.6	2.0	
	14	3.1	1.0	
	15	2.5	1.0	
	16	6.6	1.0	
	17	3.2	2.8	
	18	3.0	1.8	
	19	7.6	1.1	Slight rain in the afternoon.
	20	1.5	2.0	
	21	1.5	1.2	
	22	5.5	1.0	
	23	10.0	1.4	Rain at 3^h p. m.; continued 16 hours; amount, 0.955 inch.
	24	10.0	2.1	
	25	8.0	1.9	Light rain at 1^h a. m.; amount, 0.106 inch.
	26	8.6	1.6	
	27	9.5	1.0	
	28	4.6	1.4	
Mar.	1	2.5	1.0	
	2	10.0	1.1	Rain from 7^h a. m. to 3 p. m.; amount, 0.810 inch.
	3	6.5	1.6	
	4	4.9	2.1	
	5	7.5	1.2	
	6	2.6	2.2	
	7	6.4	1.1	
	8	8.6	2.1	Light rain in the morning; amount, 0.024 inch.
1877. Mar.	9	7.2	3.6	Rain in the morning; amount, 0.410 inch.
	10	0.4	2.4	
	11	1.8	1.1	
	12	10.0	1.0	Began to rain at 6^h p. m.; amount, 0.190 inc
	13	9.4	1.4	
	14	10.0	1.0	Light rain in the evening; amount, 0.056 in
	15	1.0	2.5	
	16	6.8	1.0	Light rain and hail at 5^h p. m.
	17	10.0	1.5	
	18	5.0	2.0	
	19	8.5	1.2	Snow in the afternoon; depth, 1.0 inch; w melted, 0.266 inch.
	20	3.0	1.4	
	21	10.0	1.0	Rain in the morning; amount, 0.142 inch.
	22	9.9	1.9	
	23	6.1	1.0	
	24	4.8	1.0	Lunar halo at 11^h p. m.
	25	10.0	1.8	
	26	10.0	2.5	Rain during the day; amount, 0.970 inch.
	27	9.9	3.6	Rain during the day; amount, 0.228 inch.
	28	5.5	1.0	Light snow after 9^h p. m.
	29	7.0	3.6	
	30	0.4	2.4	
	31	6.6	1.0	
April	1	8.1	1.4	
	2	9.5	1.5	Rain during the day; amount, 0.376 inch.
	3	5.1	1.2	
	4	9.2	1.0	
	5	8.8	1.0	
	6	5.0	1.6	
	7	2.1	1.0	
	8	10.0	1.5	
	9	9.8	3.4	Light sleet at 0^h 45^m a. m.
	10	5.1	2.4	
	11	0.6	1.1	
	12	0.4	1.0	
	13	7.0	1.9	
	14	7.0	1.8	
	15	0.3	1.0	
	16	4.9	1.0	
	17	8.8	1.1	Light rain at noon; amount, 0.100 inch.
	18	8.5	1.0	
	19	10.0	1.0	Heavy rain during the day; amount, 1.870 in
	20	8.1	1.6	Rain in the morning; amount, 0.386 inch.
	21	4.1	2.0	
	22	0.0	2.0	
	23	1.2	2.1	
	24	2.4	1.5	
	25	4.5	1.8	
	26	8.5	1.0	Light rain at 6^h p. m.
	27	10.0	1.0	Rain during the day; amount, 0.620 inch.
	28	10.0	1.0	Rain during the day; amount, 0.404 inch.
	29	9.9	1.0	Rain, with lightning and thunder, at 5^h 15^m amount, 0.432 inch.
	30	8.6	1.1	Rain at 9^h p. m.; amount, 0.032 inch.
May	1	8.0	1.9	
	2	5.6	2.4	Bright display of the aurora borealis du the evening.
	3	7.2	2.2	
	4	4.1	1.0	
	5	7.3	1.1	
	6	7.9	1.2	Rain during the morning; amount, 0.104 i
	7	5.7	1.0	
	8	10.0	1.2	Rain during the day; amount, 0.864 inch.
	9	9.0	1.1	Rain during the morning; amount, 0.116 i
	10	4.3	1.8	
	11	3.5	1.2	
	12	6.6	1.1	
	13	6.9	1.0	
	14	4.4	1.0	
	15	2.5	1.0	
	16	6.2	1.0	

TABLE VI.—*Clouds, Wind, and Weather*—Continued.

)ate.	Mean cloudiness.	Mean force of wind.	Remarks.
1877.			
ay 17	3.1	1.0	
18	2.9	1.1	
19	6.7	1.1	
20	8.1	1.1	Heavy shower at $7^h 35^m$ p. m.; amount, 0.436 inch.
21	6.9	1.2	Rain at 6^h p. m.; amount, 0.230 inch.
22	3.8	1.8	
23	2.8	2.2	
24	5.4	2.8	
25	3.1	1.8	
26	5.5	1.6	Light shower in the evening; amount, 0.036 inch.
27	5.7	1.0	
28	1.4	1.1	A fine display of the aurora borealis after 9^h p. m.
29	0.1	1.0	
30	0.2	1.0	
31	4.0	1.0	
ne 1	2.0	1.0	
2	2.6	1.1	
3	6.1	2.2	Sharp shower of rain at $2^h 45^m$ p. m.; amount, 0.216 inch.
4	6.4	1.1	Rain at 7^h a. m.; amount, 0.034 inch.
5	8.4	1.1	Rain at $5^h 35^m$ a. m.; amount, 0.764 inch.
6	8.5	1.1	Heavy showers in the morning and evening; amount, 1.464 inch.
7	7.8	1.5	
8	6.4	1.1	
9	9.8	1.6	
10	9.1	2.1	
11	7.5	1.5	
12	9.2	1.0	
13	7.9	1.5	
14	7.1	1.0	
15	8.1	1.2	
16	9.1	1.1	Rain during the day; amount, 0.146 inch.
17	5.0	1.0	
18	7.5	1.4	Light rain at $9^h 35^m$ p. m.; amount, 0.012 inch.
19	3.6	1.4	
20	5.1	1.5	
21	7.4	1.8	Heavy shower at $7^h 40^m$ p. m.; amount, 1.774 inch.
22	6.2	2.1	
23	0.1	1.5	
24	3.8	1.9	
25	2.0	1.2	
26	3.8	1.4	Heavy shower at 9^h p. m ; amount, 0.140 inch.
27	7.6	1.1	Shower at 6^h p. m.; amount, 0.072 inch.
28	8.6	1.4	Rain at 7^h a. m.; amount, 0.224 inch.
29	6.4	1.0	
30	3.9	1.2	
y 1	5.5	1.9	
2	5.9	1.2	
3	8.9	1.6	Rain in the morning and evening; amount, 1.044 inch.
4	3.0	1.8	
5	5.5	1.1	
6	6.6	1.5	Rain at 3^h a. m.; amount, 0.352 inch.
7	2.4	1.1	
8	1.9	1.1	
9	6.1	1.4	Shower at $8^h 10^m$ p. m.; amount, 0.040 inch.
10	8.0	1.2	
11	7.0	1.1	Rain at $7^h 35^m$ a. m.; amount, 0.650 inch.
12	1.6	1.2	
13	2.0	1.2	
14	3.7	1.1	
15	2.4	1.2	
16	3.4	1.0	
17	8.1	1.2	
18	8.0	1.4	
19	9.9	1.6	Rain at 6^h a. m.; amount, 0.182 inch.
20	9.5	1.1	
21	9.1	1.2	
22	8.6	1.1	Light rain at $2^h 50^m$ p. m.
23	9.6	1.0	Light rain at 9^h a. m.; amount, 0.070 inch.

Date.	Mean cloudiness.	Mean force of wind.	Remarks.
1877.			
July 24	8.5	1.1	
25	5.4	1.1	
26	4.8	1.0	
27	6.8	1.2	Rain in the evening; amount, 0.440 inch.
28	7.9	1.0	Heavy shower at 6^h p. m.; amount, 1.214 inch.
29	7.9	1.0	Heavy shower at 3^h p. m.; amount, 2.108 inches.
30	1.5	1.6	
31	3.5	1.4	
Aug. 1	9.1	1.6	Rain from 6^h p. m. to midnight; amount, 0.400 inch.
2	10.0	1.9	
3	6.9	1.0	
4	2.0	1.5	
5	0.5	1.1	
6	4.6	1.1	
7	8.1	1.1	Heavy shower at $8^h 30^m$ p. m.; amount, 0.730 inch.
8	8.0	1.0	
9	8.6	1.0	
10	3.2	1.5	
11	1.9	1.0	
12	3.4	1.5	
13	8.4	1.0	Showers during the day; amount, 0.906 inch.
14	9.0	1.1	
15	8.5	1.0	
16	3.4	1.0	Light shower at $9^h 55^m$ p. m.; amount, 0.085 inch.
17	2.1	1.1	
18	1.6	1.1	
19	2.5	1.1	
20	4.3	1.0	
21	2.6	1.0	
22	3.2	1.1	
23	8.0	1.5	Rain at 6^h p. m.; amount, 0.380 inch.
24	7.6	1.2	
25	8.2	1.0	
26	3.8	1.0	
27	3.5	1.0	
28	0.5	1.0	
29	1.2	1.0	
30	5.2	1.5	
31	4.9	1.0	
Sept. 1	8.3	1.2	
2	4.1	2.0	
3	2.1	2.0	
4	0.2	1.1	
5	7.2	1.0	
6	10.0	1.2	Heavy rain from 9^h a. m. to 3^h a. m. on September 8; amount, 2.304 inches.
7	10.0	2.0	
8	9.8	1.6	
9	3.5	1.0	
10	6.8	1.2	
11	10.0	1.0	Began to rain at noon; amount, 0.788 inch.
12	9.2	1.1	Rain at 7^h a. m.; amount, 0.608 inch.
13	9.5	1.0	Rain at 9^h a. m.; amount, 0.370 inch.
14	9.2	1.0	
15	6.4	1.1	Light rain in the morning; amount, 0.036 inch.
16	6.5	1.0	
17	6.4	1.1	Rain during the afternoon; amount, 0.464 inch.
18	8.0	1.9	
19	9.6	1.0	
20	9.1	1.0	
21	1.3	1.4	
22	0.0	1.1	
23	0.5	1.2	
24	0.8	1.0	
25	1.0	1.0	
26	3.9	1.0	
27	7.9	1.0	
28	9.5	1.1	
29	8.1	1.4	
30	0.7	1.1	

TABLE VI.—*Clouds, Wind, and Weather*—Continued.

Date.		Mean cloudiness.	Mean force of wind.	Remarks.
1877.				
Oct.	1	0.9	1.0	
	2	4.1	1.0	
	3	7.1	1.2	
	4	9.6	2.9	Heavy rain during the day; amount, 3.770 inches.
	5	0.5	2.8	
	6	1.0	1.1	
	7	2.4	1.2	
	8	9.6	1.5	Rain during the afternoon; amount, 1.502 inches.
	9	3.8	1.1	
	10	5.8	1.2	Rain in the evening; amount, 0.200 inch.
	11	5.9	1.8	
	12	3.2	1.8	
	13	2.6	1.0	
	14	1.2	1.0	
	15	1.3	1.0	
	16	2.7	1.2	
	17	6.2	1.1	
	18	3.2	1.0	
	19	5.8	1.2	
	20	8.6	1.4	Rain at intervals during the 20th and 21st; amount, 0.580 inch.
	21	10.0	1.1	
	22	6.1	2.2	Light rain in the morning; amount, 0.028 inch.
	23	0.2	1.0	White frost this morning.
	24	1.2	1.0	
	25	7.1	1.1	
	26	9.9	1.4	Rain at 9h p. m.; amount, 0.098 inch.
	27	10.0	1.5	
	28	7.6	1.0	
	29	5.2	1.1	
	30	10.0	1.0	
	31	8.1	1.4	Rain at 2h a. m.; amount, 0.076 inch.
Nov.	1	4.8	1.1	
	2	8.4	2.2	Rain at 11h 45m p. m.; amount, 0 850 inch.
	3	1.1	1.9	
	4	2.1	1.1	
	5	8.7	1.0	Rain at 3h p. m.; amount, 0.614 inch.
	6	3.8	2.5	
	7	1.0	1.0	
	8	8.1	1.4	Heavy rain in the afternoon; amount, 1.772 inches.
	9	8.2	1.1	Light rain in the evening; amount, 0.050 inch.
	10	9.8	2.1	
	11	6.1	2.1	
	12	0.1	1.1	
	13	0.1	1.0	
	14	5.8	1.0	
	15	8.4	1.5	
1877.				
Nov.	16	6.0	1.0	Light rain at 3h a. m.; amount, 0.034 inch.
	17	3.1	1.0	
	18	0.0	2.0	
	19	1.8	1.4	
	20	2.5	1.0	
	21	6.9	1.5	
	22	10.0	1.6	
	23	10.0	2.1	Rain at 9h a. m.; amount, 0.370 inch.
	24	9.9	3.0	Heavy rain during the day; amount, 2.240 inc
	25	9.0	1.1	
	26	8.8	1.4	Shower at 7h 20m a. m.; amount, 0.390 inch.
	27	4.6	1.2	
	28	6.6	1.1	
	29	6.1	1.6	
	30	2.4	2.9	
Dec.	1	3.0	1.5	
	2	4.4	1.4	
	3	1.1	1.1	
	4	6.2	1.0	
	5	10.0	1.4	Heavy rain; amount, 1.020 inches.
	6	6.1	2.5	
	7	3.0	1.6	
	8	1.8	1.0	
	9	0.6	1.9	
	10	3.7	1.2	
	11	6.5	1.0	
	12	1.4	1.1	
	13	2.9	1.6	
	14	0.2	2.0	
	15	1.9	1.0	
	16	3.1	1.2	
	17	6.1	1.0	
	18	5.4	1.2	
	19	7.2	1.0	
	20	4.1	1.0	
	21	9.8	1.4	
	22	10.0	1.0	
	23	10.0	1.0	
	24	10.0	1.0	
	25	10.0	1.0	
	26	10.0	1.0	
	27	10.0	1.0	
	28	4.4	1.0	
	29	5.2	1.2	
	30	9.8	3.0	Heavy rain during the day; amount, 1.590 in
	31	3.9	3.2	

TABLE VII.—*Rain and Snow in* 1877.

Date.	Rain and melted snow.	Depth of snow.
1877.	in.	in.
January	4.524	16.0
February	1.151	. .
March	3.096	1.0
April	4.220	. .
May	1.786	. .
June	5.146	. .
July	6.100	. .
August	2.501	. .
September	4.570	. .
October	6.252	. .
November	6.320	. .
December	2.610	. .
Total	48.276	17.0

TABLE VIII.

Monthly Means of Barometric Pressure.

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.	in.	in.	in.	in.	in.	in.	in.	in.
January	30.084	30.082	30.083	30.129	30.092	30.063	30.081	30.091
February	30.027	30.017	30.024	30.057	30.029	29.985	30.004	30.023
March	29.914	29.909	29.932	29.956	29.937	29.884	29.891	29.919
April	29.906	29.896	29.914	29.924	29.897	29.852	29.849	29.883
May	29.923	29.920	29.946	29.956	29.935	29.899	29.901	29.933
June	29.912	29.906	29.926	29.939	29.927	29.886	29.872	29.904
July	29.872	29.867	29.890	29.900	29.888	29.855	29.845	29.876
August	29.884	29.881	29.896	29.909	29.890	29.853	29.845	29.873
September . . .	29.984	29.983	30.000	30.021	30.002	29.960	29.968	29.992
October	29.974	29.970	29.984	30.007	29.975	29.931	29.947	29.971
November . . .	30.029	30.024	30.033	30.070	30.028	29.999	30.018	30.034
December	30.105	30.107	30.115	30.140	30.089	30.058	30.087	30.102
Annual means . .	29.968	29.964	29.979	30.001	29.974	29.935	29.942	29.967

Monthly Means of Dry Thermometer.

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.	°	°	°	°	°	°	°	°
January	24.7	23.4	22.2	24.1	33.4	34.7	31.1	27.8
February . . .	34.0	31.6	30.3	34.2	45.3	48.5	42.5	36.7
March	36.6	34.9	33.8	38.4	44.9	47.8	43.4	39.6
April	46.7	44.7	43.7	51.6	57.6	60.8	57.4	50.9
May	54.0	50.9	51.0	62.4	69.1	70.7	64.9	57.9
June	66.8	64.9	65.5	74.3	79.6	81.0	76.6	70.1
July	71.7	69.5	69.7	78.3	83.9	85.1	81.0	74.4
August	69.4	67.3	66.3	76.1	83.3	85.2	78.4	72.1
September . . .	62.3	60.6	59.8	68.0	74.9	75.6	69.0	64.4
October	53.9	51.9	51.8	57.4	66.4	67.2	59.7	59.7
November . . .	42.7	41.2	40.7	44.1	53.3	52.5	47.6	43.9
December . . .	38.0	36.3	35.0	37.6	47.3	48.3	43.5	40.2
Annual means . .	50.1	48.1	47.5	53.9	61.6	63.1	57.9	53.1

Monthly Means of Wet Thermometer.

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.	°	°	°	°	°	°	°	°
January . . .	27.5	26.1	24.9	27.1	33.1	34.4	31.7	28.9
February . .	33.5	31.4	30.5	33.3	40.8	43.2	39.9	35.2
March . . .	35.5	34.1	33.0	35.9	40.7	42.8	40.1	37.9
April	45.3	43.9	43.3	47.5	51.5	54.9	52.1	47.9
May	52.4	50.2	50.5	58.0	61.2	62.3	59.1	54.8
June	65.8	64.3	64.8	70.2	73.4	74.3	72.5	68.1
July	70.8	69.1	69.4	74.7	77.8	78.3	76.4	72.9
August . . .	69.1	67.2	66.5	72.8	76.4	78.0	74.9	71.1
September . .	61.9	60.5	59.2	65.4	69.3	69.8	66.6	63.7
October . . .	53.9	52.1	51.5	56.2	62.3	62.9	58.4	55.4
November . .	42.8	41.3	40.8	43.6	50.2	49.8	47.0	44.4
December . .	38.1	37.0	35.9	37.1	44.1	44.9	41.9	39.4
Annual means .	49.7	48.1	47.5	51.8	56.7	58.0	55.0	51.6

Monthly Means of Sun Thermometer.

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.	°	°	°	°	°	°	°	°
January . . .	24.0	22.3	20.2	32.6	75.7	73.1	41.0	27.5
February . .	32.3	29.4	27.8	4[illegible].1	91.3	77.5	54.9	36.0
March . . .	35.3	33.7	32.3	66.0	88.5	88.4	63.5	39.2
April	43.9	42.2	42.4	84.9	95.5	94.2	57.0	47.0
May	51.3	48.7	54.2	108.6	124.8	121.1	94.9	61.5
June	63.3	61.8	72.7	112.0	125.3	119.9	79.7	66.7
July	68.3	66.7	72.5	115.2	131.6	121.1	92.7	70.7
August . . .	66.3	64.5	66.5	114.1	131.1	131.2	109.6	68.3
September . .	58.8	57.9	58.2	101.6	116.5	106.3	67.4	60.6
October . . .	50.7	48.5	48.9	89.7	104.9	81.8	54.6	51.8
November . .	39.3	38.0	37.7	68.4	90.8	61.2	45.1	40.7
December . .	35.1	33.5	32.0	60.7	82.2	55.2	40.5	37.0
Annual means .	47.4	45.6	47.1	83.0	104.8	94.3	66.7	50.6

TABLE IX.

Showing the number of times that the wind blew from the NORTH *at the hours of observation.*

Month.	0 .	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6 .	9^{h}.
1877.								
January . . .	4	3	3	6	9	8	5	5
February . . .	0	1	1	1	5	6	5	2
March. . . .	2	2	2	3	3	2	4	4
April	3	6	5	5	6	4	7	6
May	2	3	6	5	5	4	3	2
June	1	1	3	2	1	1	0	1
July	4	3	6	4	4	4	5	3
August . . .	3	2	3	4	7	0	6	3
September . .	2	4	5	6	5	2	2	3
October . . .	3	1	4	4	2	1	3	2
November . .	1	1	0	4	3	2	1	1
December . .	0	0	1	5	4	3	4	2
Total . . .	25	27	39	49	54	37	45	34

Showing the number of times that the wind blew from the NORTHEAST *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	4	3	6	3	2	3	4	6
February . . .	2	2	1	3	0	0	1	1
March. . . .	2	1	3	2	2	2	2	2
April	9	6	8	6	5	5	4	5
May	0	2	4	1	0	1	1	1
June	2	2	2	2	0	0	0	0
July	2	4	2	3	2	2	4	5
August . . .	1	3	2	2	2	3	1	3
September . .	6	5	6	6	3	2	4	6
October . . .	4	2	4	2	2	3	2	3
November . .	3	3	3	3	2	2	3	3
December . .	3	5	4	4	0	3	4	4
Total . . .	38	38	45	37	20	26	30	39

TABLE IX—Continued.

Showing the number of times that the wind blew from the EAST *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	0	2	2	2	6	2	3	2
February . . .	1	0	3	1	2	2	7	3
March. . . .	2	4	3	4	3	2	2	1
April	3	3	1	6	11	8	7	8
May	3	1	1	5	1	0	4	3
June	2	1	1	3	3	2	3	4
July	1	1	0	3	4	3	4	2
August . . .	4	2	1	1	0	2	2	2
September . .	1	2	4	5	6	8	5	2
October . . .	3	4	1	4	6	1	5	3
November . .	4	3	5	4	4	5	6	3
December . .	1	0	1	3	9	4	2	2
Total . . .	25	23	23	41	55	39	50	35

Showing the number of times that the wind blew from the SOUTHEAST *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	5	2	2	1	2	2	3	3
February . . .	4	3	2	1	3	2	2	2
March. . . .	0	0	2	2	4	2	2	4
April	2	1	1	1	3	3	4	2
May	2	1	1	1	5	5	5	2
June	8	6	3	6	7	3	5	3
July	1	0	0	1	3	4	4	3
August . . .	0	0	1	2	7	6	5	2
September . .	4	2	1	5	4	6	4	3
October . . .	3	2	1	2	5	8	5	5
November . .	0	1	0	1	2	0	3	3
December . .	3	3	1	4	4	4	4	3
Total . . .	32	21	15	27	49	45	46	35

Showing the number of times that the wind blew from the SOUTH *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	3	3	2	1	4	6	5	4
February . . .	1	2	2	2	2	2	2	2
March. . . .	7	6	6	5	6	9	9	6
April	3	3	3	3	1	2	1	2
May	5	2	0	1	3	7	5	6
June	3	5	8	7	9	15	9	7
July	6	4	7	7	4	3	5	5
August . . .	4	3	2	4	4	6	6	3
September . .	1	1	1	1	8	5	8	2
October . . .	4	4	3	5	5	6	7	6
November . .	5	3	5	6	8	8	5	4
December . .	4	5	7	4	6	4	4	4
Total . . .	46	41	46	46	60	73	66	51

Showing the number of times that the wind blew from the SOUTHWEST *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	1	0	3	1	1	1	1	1
February . . .	1	2	1	0	1	1	1	1
March. . . .	1	0	0	1	0	3	1	2
April	0	0	0	2	1	0	1	0
May	3	3	2	3	3	1	3	5
June	3	4	4	5	3	3	5	4
July	5	5	2	1	2	5	5	3
August . . .	5	3	2	2	0	0	0	6
September . .	1	1	2	2	0	0	0	4
October . . .	1	2	1	1	1	2	2	2
November . .	3	4	1	0	0	2	2	4
December . .	4	3	2	1	0	5	2	3
Total . . .	28	27	20	19	12	23	23	35

Showing the number of times that the wind blew from the WEST *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	4	4	4	5	4	5	4	4
February . . .	5	1	2	2	4	3	2	3
March. . . .	1	1	0	1	2	2	0	3
April	1	1	1	1	0	2	3	2
May	2	6	3	4	3	7	2	3
June	5	3	2	2	2	1	3	4
July	4	3	2	1	6	2	1	3
August . . .	4	5	3	4	6	12	7	2
September . .	2	1	1	2	1	1	2	2
October . . .	2	1	3	3	5	2	1	0
November . .	1	1	1	3	3	0	0	1
December . .	0	1	0	1	1	2	2	2
Total . . .	31	28	22	29	37	39	27	29

Showing the number of times that the wind blew from the NORTHWEST *at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	7	14	8	10	3	4	5	5
February . . .	12	15	14	14	9	10	7	12
March. . . .	16	17	16	13	11	9	10	10
April	9	10	10	6	4	6	2	5
May	14	13	14	11	11	6	7	10
June	7	8	7	3	5	5	5	7
July	7	11	12	11	6	8	4	7
August . . .	11	13	17	12	5	3	4	9
September . .	14	14	9	5	3	6	5	7
October . . .	11	15	14	9	5	8	6	10
November . .	13	14	15	9	8	11	10	11
December . .	15	14	15	9	6	6	9	11
Total . . .	136	158	151	112	76	82	74	104

TABLE IX—Continued.

Showing the number of times that it was CALM *at the hours of observation.*

Month.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1877.								
January . . .	0	0	0	0	0	0	0	0
February . . .	0	0	0	0	0	0	0	0
March. . . .	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August . . .	0	0	0	0	0	0	0	0
September . .	0	0	0	0	0	0	0	0
October . . .	0	0	0	0	0	0	0	0
November . .	0	0	0	0	0	0	0	0
December . .	0	0	0	0	0	0	0	0
Total . . .	0	0	0	0	0	0	0	0

TABLE X.

Showing the number of times that it was CLEAR *at the hours of observation.*

Month.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1877.								
January . . .	10	9	10	3	2	3	3	9
February . . .	10	11	7	5	3	2	3	13
March. . . .	7	8	5	5	4	2	1	5
April	7	8	7	7	2	3	4	5
May	9	9	7	5	0	1	2	8
June	6	4	4	1	1	1	2	4
July	8	7	5	3	1	1	1	9
August . . .	8	12	4	5	0	1	0	4
September . .	9	6	4	6	3	4	4	9
October . . .	12	11	1	4	4	6	3	10
November . .	7	7	3	5	6	8	9	12
December . .	9	12	10	3	2	3	6	10
Total . . .	102	104	67	52	28	35	38	98

Showing the number of times that CIRRUS *clouds prevailed at the hours of observation.*

Month.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1877.								
January . . .	0	1	0	1	1	2	1	1
February . . .	0	2	0	0	6	3	2	1
March. . . .	0	0	0	2	1	1	0	1
April	0	0	1	1	3	2	1	0
May	3	3	1	1	1	0	1	2
June	0	0	0	2	1	1	0	1
July	0	3	1	1	1	1	1	3
August . . .	1	1	1	4	0	0	3	3
September . .	0	0	0	0	1	0	0	1
October . . .	0	0	0	1	2	0	1	0
November . .	0	2	1	1	4	1	0	1
December . .	1	0	2	2	1	1	2	1
Total . . .	5	12	7	16	22	12	12	15

Showing the number of times that CIRRO-CUMULUS *clouds prevailed at the hours of observation.*

Month.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1877.								
January . . .	5	8	6	13	18	15	13	7
February . . .	13	10	14	18	13	15	15	8
March. . . .	12	9	13	11	13	18	19	7
April	11	8	12	15	16	18	16	10
May	12	11	16	18	25	25	23	10
June	17	21	20	23	26	25	23	14
July	21	14	19	22	27	25	26	15
August . . .	17	12	22	16	30	27	21	16
September . .	13	11	11	10	19	17	18	10
October . . .	7	10	12	15	18	18	13	8
November . .	10	10	13	15	12	14	11	6
December . .	12	10	6	18	20	17	12	7
To tal . . .	150	134	164	194	237	234	210	118

Showing the number of times that CIRRO-STRATUS *clouds prevailed at the hours of observation.*

Month.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1877.								
January . . .	0	0	2	0	1	0	3	0
February . . .	1	1	1	1	1	3	2	1
March. . . .	0	0	0	0	3	1	1	0
April	0	1	0	0	0	0	1	0
May	1	3	1	0	0	0	0	0
June	1	0	2	0	1	0	0	2
July	0	0	1	0	1			0
August . . .	1	2	1	0	0			1
September . .	0	0	0	1	0			1
October . . .	1	0	0	0	1			1
November . .	2	0	1		1			0
December . .	1	1						1
Total . . .	8	8						7

TABLE X—Continued.

Showing the number of times that CUMULUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	8	6	6	2	3	2	2	6
February . . .	1	2	1	1	2	0	0	2
March . . .	3	5	3	4	1	2	5	7
April	5	6	4	2	4	5	4	4
May	1	1	0	1	1	1	1	5
June	3	3	2	1	0	1	1	4
July	2	5	3	0	1	1	1	2
August . . .	2	4	2	3	0	0	1	2
September . .	5	6	7	6	5	4	3	5
October . . .	5	4	5	5	3	3	3	4
November . .	4	5	5	1	2	1	3	6
December . .	4	3	5	3	4	4	7	6
Total . . .	43	50	43	29	26	24	31	53

Showing the number of times that CUMULO-STRATUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	0	0	0	0	0	0	0	0
February . . .	0	0	0	0	0	0	0	0
March . . .	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August . . .	0	0	0	0	0	0	0	0
September . .	0	0	0	0	0	0	0	0
October . . .	0	0	0	0	0	0	0	0
November . .	0	0	0	0	0	0	0	0
December . .	0	0	0	0	0	0	0	0
Total . . .	0	0	0	0	0	0	0	0

Showing the number of times that STRATUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	0	1	1	0	0	0	1	0
February . . .	0	1	3	0	0	1	2	0
March . . .	0	1	3	0	0	0	0	1
April	0	0	0	0	0	0	0	0
May	0	1	0	0	0	0	0	1
June	0	1	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August . . .	0	0	0	0	0	0	0	0
September . .	0	0	0	0	0	0	0	0
October . . .	1	0	2	0	0	0	3	0
November . .	1	0	2	0	0	0	1	0
December . .	0	0	1	0	0	0	0	0
Total . . .	2	5	12	0	0	1	7	2

Showing the number of times that NIMBUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	6	5	4	4	4	7	6	6
February . . .	2	1	1	1	1	3	3	2
March . . .	5	4	4	4	5	4	1	5
April	4	5	4	4	4	3	3	6
May	3	2	2	2	2	1	2	1
June	3	0	2	3	2	2	2	3
July	0	1	2	3	0	3	1	3
August . . .	2	0	0	2	1	2	2	2
September . .	2	4	2	4	2	5	2	2
October . . .	3	3	2	1	4	3	5	5
November . .	4	4	3	5	4	6	5	4
December . .	4	5	5	5	3	2	4	4
Total . . .	38	34	31	38	32	41	36	43

Showing the number of times that HAZE *prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1877.								
January . . .	2	1	2	7	3	1	0	6
February . . .	1	0	1	4	4	2	0	2
March . . .	2	2	1	3	3	2	3	5
April	2	2	1	1	1	2	1	6
May	1	1	1	2	0	1	0	1
June	0	1	1	0	0	0	1	3
July	0	3	0	0	1	0	2	3
August . . .	0	0	0	1	1	1	2	2
September . .	2	0	2	3	0	0	2	2
October . . .	1	0	2	5	0	0	1	5
November . .	2	2	2	2	0	0	1	4
December . .	1	1	2	1	0	1	1	4
Total . . .	14	13	15	29	13	10	14	43

METEORS.

1877.

METEORS OBSERVED IN 1877.

No systematic observations were made during the year.

Clouds prevented observations of the August meteors.

On November 13, from $11^h\ 0^m$ to $17^h\ 15^m$, Mr. CAHILL counted 47 meteors, nearly all small. Radiant in Leo.

The following sporadic meteors were observed.

Day.	W. M. T.	Observer.	Magnitude.	Color.	Duration.	Appearance and Duration of Train.	Length of Path.	Course of meteor among the stars.
1877.	h. m.				s.			
Feb. 21	11 20	TODD.	.	.	0.8	.	4°	From π Herculis, along parallel of δ, W. It was 3d magnitude when it appeared, but three times as bright as Sirius at disappearance.
April 21	9 56	TODD.	2	Yellow.	1	No train.	15°	First seen near γ Cephei. Disappeared midway between ψ Cassiopeæ and γ Cassiopeæ.
May 12	8 32	EASTMAN.	1	Orange.	3	Light train.	30°	From zenith directly toward α Aurigæ.
July 3	11 10	HOLDEN.	Much brighter than Jupiter.	White.	.	Red train.	.	From α Ursæ Majoris vertically downwards.
Nov. 2	8 49	SKINNER.	1	.	.	.	.	From near β Ceti to a point 5° SE. of α Piscis Australis. Probably heard the explosion.

APPENDIX I.

INVESTIGATION
OF THE
OBJECTIVE AND MICROMETERS
OF THE
TWENTY-SIX INCH EQUATORIAL
CONSTRUCTED BY
ALVAN CLARK & SONS

BY

EDWARD S. HOLDEN,
PROFESSOR OF MATHEMATICS, U. S. NAVY.

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INVESTIGATION OF THE OBJECTIVE AND MICROMETERS OF THE TWENTY-SIX INCH EQUATORIAL.

In April, 1876, the objective was removed from its cell by the Messrs. Clark for the purpose of repolishing, etc., and advantage was taken of this to study the figure of the lenses by means of an admirable spherometer, made by Grünow of New York, and kindly lent to me by Professor P. S. Michif, Professor of Astronomy at the United States Military Academy, West Point. It is much to be regretted that when the glass was originally figured the precaution was not taken by the makers to provide a small prism of the glass of each lens. This could easily have been done at the time, but in 1876, when these were wanted, no fragments of this objective remained.

Dimensions of the objective.—With a thin paper scale laid *flat* on the surface of the crown glass (out of its cell) I found the extreme distance from edge to edge $27^{\text{in}}.2$. The extreme diameter of the flint glass is $27^{\text{in}}.17$. The clear aperture is $26^{\text{in}}.00$. The cell therefore covers a zone of the objective $0^{\text{in}}.585$ in width. This wide bearing (about $\frac{1}{24}$ of the diameter) is probably greater than is necessary, but was adopted by the Messrs. Clark for security. The objective constructed by the same makers for R. J. McCormick, esq., is of the same outside dimensions, but has an aperture of 26.25 inches.

With a pair of calipers the following measures of thickness were made. They are quite exact:

	in.
Thickness of crown glass at center,	1.884
" flint glass "	0.958
" objective (in its cell) at center,	2.871

From this it follows that the distance between the crown and flint in the cell at center is $0^{\text{in}}.029$. The glasses are separated at their edges by three pieces of tin foil. These were measured as they came out from between the glasses where they had been for twenty-nine months, and their thickness was found to be $0^{\text{in}}.016$. It would appear from this that the radius of surface III was longer than that of surface II; but as these tin foils are ordinarily subjected to considerable pressure, the conclusion is not of much value. The weights of the crown and flint glasses are, respectively (according to the Messrs. Clark) 70 and 110 pounds (approximately).

Spherometer-Constants.—The spherometer was of the ordinary construction: a brass tripod, with steel legs, carrying a massive steel screw. The distance from the center of the screw to each leg was $0^{\text{m}}.090 = 3^{\text{in}}.543$. The value of 1 revolution of the screw is $0^{\text{in}}.019664 \pm 0^{\text{in}}.000002$.

The observations upon which this depends consist in measures of the height of two brass cylinders with plane ends, the property of Professor HARKNESS, U. S. N. The height of these is known by measures by Professor HARKNESS with the same measuring engine with which I investigated the micrometers, and it is checked by a measure of one of them kindly made for me by Dr. J. E. HILGARD, United States Coast Survey, Chief of the Bureau of Weights and Measures of the United States.

Date.	Observer.	Height of large cylinder.	Wt.	Height of small cylinder.	Wt.
		r.		r.	
1876, Mar. 20	HOLDEN . .	25.3700	2	. . .	.
Nov. 1	MICHIE . .	.3817	1	13.2169	1
2	MICHIE . .	.3582	1	.2111	1
9	MICHIE . .	.3643	2	.2133	2
10	MICHIE . .	.3641	2	13.2231	2
1877, Jan. 13	BASS . . .	.3614	2	. . .	.
15	BASS . . .	.3692	2	. . .	.
15	BASS . . .	.3629	2	. . .	.
15	BASS . . .	.3617	2	. . .	.
15	BASS . . .	.3586	2	. . .	.
15	BASS . . .	.3596	2	. . .	.
15	BASS . . .	25.3624	2	. . .	.
	Means .	25.3640	22	13.2168	6

The logarithms of the heights of the two cylinders in inches, according to Professor HARKNESS, are $9^{\text{in}}.41486$ and $9^{\text{in}}.69787$, from which follow

1 rev. from measures of small cylinder - - - $0^{\text{in}}.019667$, wt. 6
1 rev. from measures of large cylinder - - - $0^{\text{in}}.019663$, wt. 22

The final value is $0^{\text{in}}.019664$. I shall omit the last decimal. The agreement of the two absolutely independent values is exact to the fifth decimal; that is as far as it was used No term dependent on temperature was introduced, but, considering the precautions taken at the time of the measures, no such term will materially alter the results given.

In all of the measures which follow, the zero reading of the spherometer was obtained by placing it upon a plane glass heliostat mirror, the property of the United States Transit of Venus Commission. The mirror used was marked "*Crozet*," and had a radius of curvature of over one mile. In making the measures of the objective, a zero was first obtained, then a reading was made on one of the lenses, then another zero followed by another reading, and so on continuously. The zero was found to be practically constant during the time of the measures.

During the measures of the crown glass, it was laid upon two feather pillows which supported all of the glass except two very small segments on the extreme edges. I therefore think there was no appreciable flexure of this lens during the measures. The measures were taken at three points on the lens; at its center, and at points equally distant from the center and the edges. The readings were the same for these three points (as was to be expected), and they are not discriminated in the summary which follows. The same process was followed in measures of the III surface (the concave surface of the flint).

During the measures of the flint glass it was supported on two parallel sticks of soft pine wood about 12 inches apart, each 12 inches long. There is more probability of flexure in this lens than in the crown.

Radii of Curvature of the Four Surfaces of the Objective.—The results of the measures are summarized below. The quantity measured is, of course, the distance by which the glass surface was above (+) or below (—) the plane of the three feet of the spherometer. The column "I No." gives the number of single measures on surface I, and the column "Plane No." the number of measures on the plane surface.

I, II, III, and IV denote the various surfaces of the objective, counted in order, beginning at the end farthest from the principal focus. The means are of the daily results which I have assumed to be of equal weight.

Date.	Surfaces on which measures were made.											
	I.	I No.	Plane No.	II.	II No.	Plane No.	III.	III No.	Plane No.	IV.	IV No.	Plane No.
1876.	rev.			rev.			rev.			rev.		
Apr. 20	+ 1.9789	50	26	+ 1.9791	51	46	. .	.	.	+ 0.0167	20	10
21	+ 1.9772	15	20	+ 1.9780	16	15	— 1.9700	17	15	+ 0.0160	18	15
24	. .	.	.	. .	.	.	— 1.9700	15	15	. .	.	.
Sums .	. .	65	46	. .	67	51	. .	32	30	. .	38	25
Means.	+ 1.9781	.	.	+ 1.9785	.	.	— 1.9700	.	.	+ 0.0164	.	.

The measured values in English inches are 0.03890 (I and II), 0.03873 (III), and 0.00032 (IV) inches, respectively. Surfaces I and II were worked by the makers on the same tool, and the glass was constantly turned over, thus working first one surface and then the other. It is probable from this fact alone that the radii of I and II are the same, and I assume + $1^{r}.9783$ as the reading to determine this. It appears that IV is convex slightly, and also that III is of longer radius than I and II. It is possible though not at all probable that the flexure of surface III might be as much as 0.0083, which would make I, II, and III of the same radius.

If r = radius of circle passing through the 3 feet of the spherometer [$= 3^{in}.543$],

R = radius of curvature of glass surface,

h = reading of spheromoter-screw in inches,

then

$$R = \frac{r^2}{2h} + \frac{h}{2}.$$

The concluded values of the radii are, then,

$$\begin{aligned} & \quad\ \text{in.} \qquad\quad \text{in.} \\ R_{\text{I}} &= + \quad 161.39 \pm 0.03, \\ R_{\text{II}} &= + \quad 161.39 \pm 0.03, \\ R_{\text{III}} &= - \quad 162.07 \pm 0.03, \\ R_{\text{IV}} &= + \ 19466. \quad \pm 4000, \end{aligned}$$

where a *plus* sign indicates a convex surface.

From the equation above, supposing r constant,

$$dR = \frac{h-R}{h} \, . \, dh.$$

For the first three surfaces R is about 161 inches and h about $0^{\text{in}}.04$; therefore $(dR) = 4000 \; dh$ approximately. The accidental error of the adopted spherometer measures for the first three surfaces is hardly above $0^{\text{r}}.0004 = 0^{\text{in}}.00007$, or $dR = 0^{\text{in}}.028$. For IV, $dR = 66{,}400{,}000 \; dh$.

The goodness of the spherometer measures themselves can be judged of by the discordance of the measures of the surfaces I and II. These we know *à priori* to be of the same curvature. The measures of the versed sine on the two surfaces I and II differ by $0^{\text{r}}.0004 = 0^{\text{in}}.00007$. Assuming that each concluded and final value of this versed sine is erroneous by the whole discordance between these two measures ($0^{\text{r}}.0004$), the radii of curvature of the first three surfaces are determined with a probable error of $0^{\text{in}}.028$ when we assume certain indices of refraction. These could not be determined *à posteriori*, as no prisms of the glass were at hand. They are not far erroneous, as the difference between the principal focal length computed from them and directly measured is only $0^{\text{in}}.1$ or $\frac{1}{3900}$th part.

Constants of the Objective.—The position of the "second principal point" (*Hauptpunkt*) has been computed by the following modification of GAUSS' formulæ (*Werke*, vol. v), used by Professor NEWCOMB in the discussion of the photographic objectives of the Transit of Venus photoheliographs. It relates to a small central pencil of rays:

Let

t_1, t_2, t_3 be the thickness of the glasses divided by their respective indices of refraction, n, 1, and n';

$t_1 \div n$ = thickness of crown; t_2 = air; $t_3 \div n'$ = flint;

r_1, r_2, r_3, r_4 the radii of curvature; r_1 and r_2 for the crown, r_3 and r_4 for the flint;

r is positive when the center of curvature lies on the same side of the surface as the radiant point.

$$\left\{ u = \frac{n-1}{r_1}, \quad u' = \frac{1-n}{r_2} \right\} \text{crown};$$

$$\left\{ u'' = \frac{n'-1}{r_3}, \quad u''' = \frac{1-n'}{r_4} \right\} \text{flint};$$

$$h = t_1 + t_2 + t_3; \quad k = u + u' + u'' + u''';$$

$$l - 1 = u' \, t_1 + u'' \, (t_1 + t_2) + u''' \, (t_1 + t_2 + t_3);$$

$$g - 1 = u'' \, t_3 + u' \, (t_2 + t_3) + u \, (t_1 + t_2 + t_3);$$

$f = -g \div k$ = distance of principal forms from the back surface of the glass;

$s = (l - 1) f + h$ = distance of second principal point from the back s of the flint, measured toward the crown;

$F = f + s$ = principal focal distance. *Check*: $l + g - 2 = kh$.

From the above formula, assuming $n = 1.5172$, $n' = 1.6280$, values near the truth, I obtain $s = 2.202$ $F = 389.56$. The mean of direct measures gives $F = 389.66$. The agreement of these shows the data to be very near the truth. The objective being 2.871 inches thick, the distance of the second principal point from the first surface is 0.669. I shall assume it as 0.67. Dr. HASTINGS, Professor of Physics in the Johns Hopkins University, has kindly computed this independently and comes to the same result.

The elements of this objective are, then:

Aperture = 26.00 English inches.
Principal focal length = 389.66 ± 0.05 at 32° F. [This depends on direct measures.]
Distance of second principal point from IV surface = 2.202 inches.[*]
Thickness of objective = 2.871 inches.

The crown glass is equi-convex:

Radii of curvature, $R_I = R_{II}$ - - - = 161.39 ± 0.03 inches.
Thickness - - - - - - - - - - - = 1.884 ± 0.001 "
Index of refraction - - - - - - - = 1.5172 ± ?

The flint glass is concavo-convex:

R_{III} - - - - - - - - - - - - - = 162.07 ± 0.03 inches.
R_{IV} - - - - - - - - - - - - - = 19466. ± 4000 "
Thickness - - - - - - - - - - - = 0.958 ± 0.001 "
Index of refraction - - - - - - - = 1.6280 ± ?

The magnitude of the smallest star (on ARGELANDER'S scale extended) to be seen with this objective is 16.3.[†]

The separating power is, according to DAWES' formula,[‡] $0''.18$. While the objective was still in the workshop of the Messrs. CLARK, artificial stars (monochromatic light), $0''.3$ apart, were seen divided. The closest double stars seen divided have been B. A. C. 586, which was observed 1874, November 27, by Professor NEWCOMB, with a distance $0''.23$, and B. A. C. 4559, observed 1878, June 19, by Professor HALL, with a distance $0''.24$.

Measures of the Focal Length of the Objective.—Measures to determine the distance between the optical center of the objective and the plane of the micrometer threads have been made at various times. The distance actually measured has been that etween a tangent plane to the first or fourth surface of the objective and the middle f the micrometer box. Small corrections to the measured distance gave the true focal istance required. These corrections were known to less than $0^{in}.005$ in all cases, d the uncertainty lies in the measure of the 32 feet between the objective and eye-end of the telescope. These measures were in all cases made with steel tapes or rules, which have been compared directly or indirectly with Coast Survey standards.

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[*] The other *Hauptpunkt* is beyond the objective, about $0^{in}.35$.

[†] See POGSON, *Mon. Not.*, R. A. S., vol. xxi, p. 34.

[‡] Memoirs R. A. S., vol. xxxv, p. 159.

On January 17, 19, and 24, 1876, the focal distance was measured by means of a steel tape-line. These measures were intended only to obtain the focal length approximately for computation of the magnifying powers, and they necessarily will give this length a little too great on account of the unknown stretch of the tape-line, which was vertical, and which had a weight at its lower end. The measures gave the focal distance January 17, F. = $389^{\text{in}}.87$; January 19, F. = 389.95; January 24, 389.95.

On June 15, 1877, the telescope was placed horizontal and in the meridian, and wire plumb-lines were suspended near the ends of the telescope tube and their distance apart measured by steel rules laid on boards supported on trestles. The focal distance was found to be by two independent measures $389^{\text{in}}.620$, $389^{\text{in}}.620$.

On June 18, 1877, the above measures were repeated by a slightly different and (as it afterwards appeared) less satisfactory process. The separate results for the focal length were 389.814, 389.876, and 389.781 inches.

A measure was made 1877, December 10, in the same way as the first measures of 1876. The result was 389.790 inches.

If F_t is the distance from the optical center of the objective to the focal plane at a temperature t° Fahr., F_0 this distance at 32° Fahr., and k the coefficient of expansion of the steel tube, then

$$F^t = F^0\,(1 + k.\,t^\circ)$$

It will be seen from what follows that the lengths of one revolution of the steel micrometer screws in English inches at 32° are

$s' =$ (for Screw I) 0.018775 ± 0.000002 inches,
$s'' =$ (for Screw II) 0.018763 ± 0.000001 "

assuming the coefficient of expansion for 1° F. for the screws to be 0.00000680. I assume this coefficient (k) for the telescope tube to be 0.00000600. Each of these factors may be slightly erroneous.

If R be the value of 1 rev. of the screw in arc (required); s' or s'' the length of 1 rev. in inches; F_0 the principal focal length in inches; then

$$R' = \frac{s'}{F_0 \sin 1''} \text{ and } R'' = \frac{s''}{F_0 \sin 1''}.$$

I have collected the various measures in the following table:

Series.	Date.	F_t	t	Wt.	Observers.	F_0	R' (Mic. I.)	R'' (Mic. II.)
			°			in.	″	″
	1876, Jan. 17	389.87	44	1	Hn.; G.			
	19	.95	58	1	Hn.; G.			
	24	.95	37	1	Hn.; G.			
I.	(1876, January)	(389.923)	(46)	(3)	. . .	389.890	9.933	9.924
	1877, June 15	389.620	84.5	4	Hn.; D.			
	15	.620	84.5	4	Hn.; D.			
II.	(1877, June 15)	(389.620)	(84.5)	(8)	. . .	389.497	9.943	9.934
	1877, June 18	389.814	84.0	3	Hn.; D.			
	18	.876	84.0	3	Hn.; D.			
	18	.781	84.0	3	Hn.; D.			
III.	(1877, June 18)	(389.824)	(84.0)	(9)	. . .	389.702	9.938	9.929
IV.	1877, Dec. 10	389.79	44.4	2	N.; T.	389.761	9.936	9.928

Whence

1 rev. Micrometer I - - - - - - - - - $= 9''.939 \pm 0''.001$
1 rev. Micrometer II - - - - - - - - - $= 9''.930 \pm 0''.001$
F_0 - - - - - - - - - - - - - - - - $= 389.66 \pm 0.05$ inches.

The uncertainty in the value of F_0 is about one part in 7800.

The values of R' and R'', as found by observations of transits of stars, are $9''.947$ and $9''.927$, respectively. Assuming these to be correct, the values from direct measures are erroneous by $\frac{1}{1240}$th and $\frac{1}{3310}$th part respectively, the value for R' being in defect, and that for R'' being in excess.

It was at first thought that a possible explanation of this discrepancy might be that the focal distance for the whole objective was not the same as that for its central regions. To test this the following observations were made of the difference of declination of *Electra* and *Merope Pleiadum*, first, with an aperture of 26 inches; second, with that aperture reduced to 4 inches; and, third, with the central portions stopped out by a disc 20 inches in diameter, leaving a zone 3 inches in width. Micrometer I was used throughout.

Date.	Hour-angle.	Measured $\Delta\delta$	Eye-piece.	Image.	1 rev. =
I. Aperture, 26 inches.					
1877.	h. m.	r.			″
Dec. 7	+ 0 22	58.436	600 A	3	9.942 (5)
11	− 1 56	58.441	400 A	2	9.941 (5)
II. Aperture, 4 inches.					
Dec. 7	+ 0 53	58.432	600 A	4	9.942 (5)
11	− 1 39	58.451	400 A	2	9.939 (5)
III. Annular aperture, 3 inches.					
Dec. 31	+ 0 53	58.418	400 A	2	9.945 (5)
1878.					
Jan. 2	+ 1 16	58.476	400 A	3	9.935 (5)
3	+ 0 35	58.442	400 A	3	9.941 (5)
3	+ 0 57	58.434	600 A	3	9.942 (5)

The true $\Delta\delta$ of Electra and Merope is, according to the unpublished results of Professor NEWCOMB, 581″.11 for 1877.0; for December 7 and 11 this requires a correction of + 0″.02, and for the other dates one of + 0″.03 to reduce to the dates; and the differential refraction is 0″.18, except for the last observation of December 11, when it is 0″.19.

The observations are to be regarded as equally accurate, having been made under about the same circumstances, except for those of January 2, when bright wires in a dark field were used, the other observations having been made with a bright field and dark wires. It appears from the separate results that the focus is the same for the whole objective, its central four inches, and an external zone three inches in width.* Thus transit observations (in which pencils of rays inclined to the axis are used) and direct measures ought to give the same values for the micrometer revolution.

It will be necessary to measure accurately the indices of refraction of the crown and flint lenses in order to make a complete discussion of this objective. I have computed the course of inclined pencils of rays through the objective by HANSEN's rigorous formulæ, but find (as was to be expected) the data as to the nature of the glass much too uncertain for the results to be definitive.

Investigation of the Inequalities of the Screw of Micrometer I.—The periodic errors of this screw were investigated by means of the "Ruled Glass Scale Micrometer," the property of the Observatory, devised by Professor HARKNESS, U. S. N., for the measurement of the photographs of Solar Eclipses, Transits of Venus, and the like. This instrument is to be described in the forthcoming publications of the United States Transit of Venus Commission.

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* Considering these measures as equally accurate, they give for the value of one revolution of Mic. I, 9″.9409 ± 0″.0007.

I assume from that discussion the logarithm of 1 division of the glass scale in English inches, at t° F., as follows: log 1 $D = 8.2985670 + 0.000002103\ (t^\circ - 32^\circ \text{ F.})$, or 1 D, at 72° F., $= 0^{\text{in}}.01989071 \pm 0^{\text{in}}.00000007$.

It is only necessary for the present purpose to know that this engine consists essentially in a finely divided glass scale whose divisions "D" are each about $0^{\text{in}}.02$; parallel to this scale a slide-rest, bearing a micrometer eye-piece ("Micrometer A") moves. The value of 1 revolution of Micrometer A ("R") in scale divisions varies with the focal adjustment but $6.6\ R = 1\ D$ approximately. One revolution of Micrometer I ("r") is equal to $9''.95$ approximately, and the relation observed between D and r, or R and r, enables us to express the residuals in arc; this I have done in each table in order to exhibit these in a familiar unit.

The method of observation was as follows: Micrometer I was placed so that its screw was exactly parallel to the glass scale; Micrometer A was focused on the threads of Micrometer I. Micrometer I was then set at a given revolution; the scale of the engine was read; usually it gave an integer division, which is given here *plus* the division corrections determined by Professor HARKNESS. Four settings of the movable wire of Micrometer A were then made on the wire of Micrometer I, two on each side. These were made by moving the screw of Micrometer A only, the final bisection being made against the springs. The mean of these four is alone set down in the following pages.

When this measure was completed the movable wire of Micrometer I was moved 1^{r} or $0^{\text{r}}.25$ according to the series in hand, and its wire was again observed with the wire of Micrometer A *without* moving Micrometer A itself in relation to the divided glass scale. This continued until the screw of Micrometer A was nearly run out. Then Micrometer A was moved back about 10^{r} or 15^{r}; a new setting on the scale was observed, and thus for each revolution of Micrometer I, where the scale setting was changed, we have *two* independent readings of the Micrometer A and of the scale. The mean of these is assumed to be correct, but both are here set down, as their differences give a test of the accidental errors of setting, and of the constancy of position of Micrometer I relative to the scale.

The readings of Micrometer A in revolutions can be transformed into scale divisions by data derived from the observations themselves, and these scale readings again can be transformed into arc, as above explained. The object of the measures was:

First. To determine the length of the mean revolution of Micrometer I in inches.

Second. To determine the inequalities of the several whole revolutions from 40^{r} to 90^{r} (the part of the screw most used) a space of over $497''$.

Third. To determine the *periodic* errors of this screw over the central parts 58^{r} to 70^{r} ($119''$). The observations made for these purposes follow in chronological order.

1874, *January* 20. Observer, NEWCOMB.

MICROMETER I. $t =$ about 70° F.

Microm. I.	Scale of engine (corrected).	Δ 1 rev. =	v in divisions.	v in arc.
r.	D.			
55.000	166.225	D.	D.	″
56.	5.285	0.940	+ 0.004	+ 0.042
57.	4.337	48	− .004	− .042
58.	3.392	45	− .001	− .011
59.	2.448	44	.000	.000
60.	1.508	40	+ .004	+ .042
61.	160.571	37	+ .007	+ .074
62.	159.624	47	− .003	− .032
63.	8.678	46	− .002	− .021
64.	7.733	45	− .001	− .011
65.	6.790	43	+ .001	+ .011
66.	5.845	45	− .001	− .011
67.	4.897	48	− .004	− .042
68.	3.949	48	− .004	− .042
69.	3.009	40	+ .004	+ .042
70.	2.066	43	+ .001	+ .011
71.	1.123	43	+ .001	+ .011
72.	150.184	39	+ .005	+ .053
73.	149.233	51	− .007	− .074
74.	8.289	44	.000	.000
75.	7.341	48	− .004	− .042
76.	6.396	45	− .001	− .011
77.000	145.451	0.945	− 0.001	− 0.011
	Mean .	0.9443		

On the same day the Micrometer I was set at each quarter revolution from and including 62.00 to and including 66.25, this being the portion of the screw most frequently used. On each position of the screw of Micrometer I four bisections were made by means of the eye-piece micrometer of the engine ("A"). In the following table Δ^1 is the value of each quarter revolution of I in revolutions of "A" in the first set of measures (each Δ^1 depending on two bisections). Micrometer "A" was then moved forward on the engine $0^r.50$, and a second set of measures made in the new position of "A," each Δ^2 being the mean of two measures.

1874, *January* 20. NEWCOMB.

Micrometer I.	Microm. A. Δ^1	Microm. A. Δ^2	$\frac{\Delta^1 + \Delta^2}{2}$	v in rev.	v in arc.	v from obs. of 1876.
r. r.	R.	R.	R.	R.	"	"
62.00 – 62.25	1.5745	1.5515	1.563	0.000	0.000	+ 0.032
.25 – .50	.5685	.5605	.565	.002	– .003	.000
.50 – .75	.5615	.554	.558	.005	+ .008	.000
.75 – 63.00	.557	.559	.558	.005	+ .008	.000
63.00 – .25	.561	.586	.574	.011	– .018	.000
.25 – .50	.5845	.540	.562	.001	+ .002	+ .016
.50 – .75	.537	.585	.561	.002	+ .003	– .016
.75 – 64.00	.581	.5545	.568	.005	– .008	– .032
64.00 – .25	.557	.5745	.566	.003	– .008	.000
.25 – .50	.573	.567	.570	.007	– .011	+ .016
.50 – .75	.5595	.549	.554	.009	+ .014	+ .016
.75 – 65.00	.5665	.577	.572	.009	– .014	– [.112]
65.00 – .25	.5705	.554	.562	.001	+ .002	– .016
.25 – .50	.5575	.570	.564	.001	– .002	– .048
.50 – .75	.568	.5525	.560	.003	+ .005	+ .064
.75 – 66.00	.553	.569	.561	.002	+ .003	+ .032
66.00 – .25	[1.525]*	1.5605	1.561	0.002	+ 0.002	+ 0.032
	* Rejected.		1.563			

From these measures it follows that 1*r*. [= 9″.95] = 6^R.25, and the residuals v [corrections], can be thus expressed in arc.

We may collect these in four groups: I. Comprising the residuals belonging to the first quarter-revolution ^{r}.00 to .25. II. .25 to .50. III. .50 to .75. IV. .75 to .00.

"
The mean correction for I. is — 0.0055 from 5 measures.
" " II. is — 0.0035 4 "
" " III. is + 0.0075 4 "
" " IV. is — 0.0028 4 "

The last column of the table gives the separate results from a series made 1876, May 1. From the measures of 1876 it follows that

"
The mean corrections are for I. + 0.0096 from 5 measures.
" " II. — 0.0040 4 "
" " III. + 0.0160 4 "
" " IV. 0.0000 3 "

1876, *April* 29. HOLDEN. $t = 67^\circ.8$ F.

Mic. I.	Scale of engine (corrected).	Mic. A. revolutions.	Mic. A. in scale divisions.	Scale + Mic. A.	Δ 1 rev. =	v in rev.	v in arc.
r.	D.	R.	D.	D.	D.	D.	″
90.000	170.019	16.46	2.488	172.507	0.943	+ .001	+ 0.011
89.		22.70	3.431	173.450	.946	− 2	− .021
88.		28.96	4.377	174.396	.945	− 1	− .011
87.		35.22	5.322	175.341	.944	0	.000
86.		41.46	6.266	176.285	.937	: + 7	+ [.074]
85.000	170.019 175.019	47.67 14.57	7.204 2.202	177.223 177.221	.954	: − 10	− [.105]
84.		20.88	3.157	178.176	.942	+ 2	+ .021
83.		27.11	4.099	179.118	.943	+ 1	+ .011
82.		33.36	5.042	180.061	.946	− 2	− .021
81.		39.62	5.988	181.007	.942	+ 2	+ .021
80.000	175.019 180.020	45.84 12.76	6.929 1.929	181.948 181.949	.938	+ 6	+ .063
79.		18.97	2.867	182.887	.947	− 3	− .032
78.		25.23	3.814	183.834	.943	+ 1	+ .011
77.		31.48	4.757	184.777	.948	− 4	− .042
76.		37.74	5.705	185.725	.940	+ 4	+ .042
75.000	180.020 185.020	43.98 10.87	6.648 1.642	186.668 186.662	.939	+ 5	+ .053
74.		17.10	2.584	187.604	.946	− 2	− .021
73.		23.35	3.530	188.550	.943	+ 1	+ .011
72.		29.59	4.473	189.493	.946	− 2	− .021
71.		35.85	5.419	190.439	0.940	+ 4	+ .042
70.000	185.020 189.020	42.11 15.56	6.365 2.352	191.385 191.372			
				Mean . .	0.9436		

1876, *May* 1. HOLDEN. $t = 59^\circ.0$ F.

Micrometer I.	Scale of engine (corrected).	Micrometer A (revolution).	Δ for ¼ revolutions.	*v* (corrected).	*v*	Micrometer I.	Scale of engine (corrected).	Micrometer A (revolution).	Δ for ¼ revolutions.	*v* (correction).	*v*
r.	D.	R.	R.	″	″	r.	D.	R.	R.	″	″
70.	189.020	15.58	1.57	−0.01	−0.016	64.75	. .	21.56	1.57	− .01	− .016
.75	. .	17.15	1.56	.00	.000	.50	. .	23.13	1.55	+ .01	+ .016
.50	. .	18.71	1.57	− .01	− .016	.25	. .	24.68	1.56	.00	.000
.25	. .	20.28	1.54	+ .02	+ .032	63.	. .	26.24	1.56	.00	.000
69.	. .	21.82	1.57	− .01	− .016	.75	. .	27.80	1.56	.00	.000
.75	. .	23.39	1.58	− .02	− .032	.50	. .	29.36	1.56	.00	.000
.50	. .	24.97	1.58	− .02	− .032	.25	. .	30.92	1.54	+ .02	+ .032
.25	. .	26.55	1.55	+ .01	+ .016	62.	. .	32.46	1.58	− .02	− .032
68.	. .	28.10	1.56	.00	.000	.75	. .	34.04	1.55	+ .01	+ .016
.75	. .	29.66	1.55	+ .01	+ .016	.50	. .	35.59	1.57	− .01	− .016
.50	. .	31.21	1.56	.00	.000	.25	. .	37.16	1.56	.00	.000
.25	. .	32.77	1.55	+ .01	+ .016	61.	. .	38.72	1.56	.00	.000
67.	. .	34.32	1.57	− .01	− .016	.75	. .	40.28	1.56	.00	.000
.75	. .	35.89	1.56	.00	.000	.50	. .	42.84	1.56	.00	.000
.50	. .	37.45	1.56	.00	.000	.25	. .	43.40	1.56	.00	.000
.25	. .	39.01	1.54	+ .02	+ .032	60.	. .	44.96	. .	. .	. .
66.	. .	40.55	1.54	+ .02	+ .032	60.	199.022	11.90	1.58	− .02	− .032
.75	. .	42.09	1.52	+ .04	+ .064	.75	. .	13.48	1.57	− .01	− .016
.50	. .	43.61	1.59	− .03	− .048	.50	. .	15.05	1.54	+ .02	+ .032
.25	. .	45.20	1.57	− .01	− .016	.25	. .	16.59	1.50	+ .06	+ .096
65.	189.020	46.77	. .	. .	. .	59.	. .	18.09	1.58	− .02	− .032
65.	194.021	13.69	1.63	−[.07*]	[− .112]	.75	. .	19.67	1.57	− .01	− .016
.75	. .	15.32	1.55	+ .01	+ .016	.50	. .	21.24	1.55	+ .01	+ .016
.50	. .	16.87	1.55	+ .01	+ .016	.25	. .	22.79	1.57	− .01	−0.016
.25	. .	18.42	1.56	.00	.000	58.	199.022	24.36			
64.	. .	19.98	1.58	− .02 * Rej.	− .032			Mean	1.561		

From the above it follows that 1 rev. [= 9″.95] = 6.24*R*, or 1 *R*. = 1″.59 in arc of the XXVI-inch Equatorial.

Collecting the various results for quarter revolutions, we have the following

TABLE.

r.	I. .00 to .25	II. .25 to .50	III. .50 to .75	IV. .75 to .00	r.
	″	″	″	″	
58	+ 0.096	+ 0.016	− 0.016	− 0.032	59
59	+ 0.096	+ .032	− .016	− .032	60
60	.000	.000	.000	.000	61
61	.000	− .016	+ .016	− .032	62
62	+ .032	.000	.000	.000	63
63	.000	+ .016	− .016	− .032	64
64	.000	+ .016	+ .016	. .	65
65	− .016	− .048	+ .064	+ .032	66
66	+ .032	.000	.000	− .016	67
67	+ .016	.000	+ .016	.000	68
68	+ .016	− .032	− .032	− .016	69
69	+ 0.032	− 0.016	0.000	− 0.016	70
Σ	+ 0.192	− 0.032	+ 0.032	− 0.154	
No.	12 obs.	12 obs.	12 obs.	11 obs.	
Mean	+ 0.0160	− 0.0027	+ 0.0027	− 0.0140	

Therefore for the revolutions 58 to 70, inclusive, we have:

The mean correction for I. is + 0.0160 from 12 measures
" " II. is — 0.0027 " 12 "
" " III. is + 0.0027 " 12 "
" " IV. is — 0.0140 " 11 "
Σ + 0.0020

It will be of interest to compare the results from the revolutions 62–66 with those previously obtained in 1874, and, accordingly, I have written in the last column of a previous Table the results from the measures above.

Since these mean corrections are much below the accidental errors of the measures which will be made with this screw, I consider it unnecessary to examine the question of *periodic errors* in this screw any further.

We may note, however, that in the previous Table, (1874, January 20), the numbers in the two last columns are not strictly comparable, as the series of 1874 depends upon *two* series with different initial positions of the Micrometer "A" to eliminate errors of its screw, while the later series depends upon fewer measures, all taken from one initial position of this screw.

We may regard the *signs* of the periodic inequalities (corrections) of Screw I as well determined; if it were desirable to fix the absolute values of the corrections further observations would be required. We may then say:

The periodic inequalities of Screw I, from 58^{r} *to* 70^{r}, *are far less than the accidental errors of the measures which will be made with it, and they need not be further considered.*

The complete series of May 1 will also serve to fix the values of the whole revolutions from 40^{r} to 70^{r}. I extract from the last table what is necessary for this purpose.

1876, *May* 1. $t = 59^\circ.5$ *F.*

Mic. I.	Scale of engine (corrected).	Mic. A (revolutions).	Mic. A (scale divisions).	Scale + Mic. A.	Δ 1r =	ν in rev.	ν in arc.
r.	D.	R.	D.	D.	D.	D.	''
70.000	189.020	15.58	2.354	191.374			
					0.944	+ 0.001	+ 0.011
69.	. . .	21.82	3.298	192.318			
					.949	− .004	− .042
68.	. . .	28.10	4.247	193.267			
					.941	+ .004	+ .042
67.	. . .	34.32	5.188	194.208			
					.942	+ .003	+ .032
66.	. . .	40.55	6.130	195.150			
					.939	+ .006	+ .063
65.	189.020	46.77	7.068	196.088			
65.	194.021	13.69	2.069	196.090			
					.953	− .008	− .084
64.	. . .	19.98	3.021	197.042			
					.946	− .001	− .011
63.	. . .	26.24	3.967	197.988			
					.940	+ .005	+ .053
62.	. . .	32.46	4.907	198.928			
					.945	.000	.000
61.	. . .	38.72	5.852	199.873			
					.946	− .001	− .011
60.	194.021	44.96	6.795	200.816			
60.	199.022	11.90	1.799	200.821			
					.937	+ .008	+ .084
59.	. . .	18.09	2.734	201.756			
					.948	− .003	− .032
58.	. . .	24.36	3.682	202.704			
					.942	+ .003	+ .032
57.	. . .	30.59	4.624	203.646			
					.947	− .002	− .021
56.	. . .	36.86	5.571	204.593			
					.943	+ .002	+ .021
55.	. . .	43.10	6.514	205.536			
					.941	+ .004	+ .042
54.	199.022	49.30	7.450	206.472			
54.	204.022	16.27	2.459	206.481			
					.949	− .004	− .042
53.	. . .	22.52	3.404	207.426			
					.947	− .002	− .021
52.	. . .	28.79	4.351	208.373			
					.946	− .001	− .011
51.	. . .	35.04	5.297	209.319			
					.941	+ .004	+ .042
50.	. . .	41.27	6.238	210.260			
					.949	− .004	− .042
49.	204.022	47.52	7.183	211.205			
49.	209.023	14.48	2.189	211.212			
					.948	− .003	− .032
48.	. . .	20.74	3.134	212.157			
					.945	.000	.000
47.	. . .	26.98	4.079	213.102			
					.942	+ .003	+ .032
46.	. . .	33.22	5.021	214.044			
					.944	+ .001	+ .011
45.	. . .	39.46	5.965	214.988			
					.940	+ .005	+ .053
44.	209.023	45.67	6.902	215.925			
44.	213.023	19.23	2.907	215.930			
					.945	.000	.000
43.	. . .	25.47	3.850	216.873			
					.946	− .001	− .011
42.	. . .	31.73	4.796	217.819			
					.951	− .006	− .063
41.	. . .	37.96	5.747	218.770			
					0.944	+ 0.001	+ 0.011
40.000	213.023	44.27	6.691	219.714			
				Mean . .	0.9447		

On November 12, 1878, Professor **Harkness** made a set of measures on this screw to determine the value of the mean revolution. These are given below. The last three columns of the table contain the values in scale divisions of the same lengths of 10^r, as previously determined by Professor **Newcomb** and myself.

Micrometer I. 1878, *November* 12. Observer, Harkness.

Mic. I.	Scale on Fixed Wire.	Scale on Movable Wire.	Δ	1878, Nov. 12. 10r. =	1874, Jan. 20. 10r. =	1876, April 29. 10r. =	1876, May 1. 10r. =
r.	D.	D.	D.	D.	D.	D.	D.
100.00	197.750	163.855	− 33.895				
90.	.750	173.296	− 24.454	9.441	. .	. .	. .
80.	.749	182.732	− 15.017	9.437	. .	9.442	. .
70.	.753	192.174	− 5.579	9.438	. .	9.436	. .
60.	.748	201.619	+ 3.871	9.450	9.442	. .	9.445
50.	.741	211.054	+ 13.313	9.442	. .	. .	9.441
40.	.741	220.491	+ 22.750	9.437	. .	. .	9.454
30.00	197.737	229.934	+ 32.197	9.447	. .	. .	. .

Length of the Mean Revolution of Micrometer I (40 to 90 rev.) in inches at 32° F.— The preceding observations will serve to determine the length of one revolution of the screw I at 32° F. in inches. The numbers which are necessary for this purpose I extract from the preceding detailed observations.

The coefficient of expansion of the steel screw for 1° F. I assume as 0.00000680, so that the length of one revolution of the screw at $t°$ F. is (assuming its length at 32° F. as unity),

$$1 + 0.00000680\ (t^\circ - 32^\circ), \text{ or}$$
$$1 + [4.832509]\ (t^\circ - 32^\circ).$$

The means of reducing the readings of the glass scale have already been given.

Date.	Temp.	Observer.	Limiting Revolution Mic. I.	No. of Rev. Mic. I	No. of Scale Divisions.	No. of Rev. Mic. I at 32° F.	No. of inches at 32° F.	1 Rev. at 32° F.
			r. r.	r.	D.	r.	in.	in.
1874, Jan. 20	70° F.	Newcomb.	55 − 77	22 =	20.774	22.005685	0.413206	0.018777
1876, Apr. 29	67.8	Holden.	70 − 90	20 =	18.878	20.004896	0.375491	0.018770
May 1	59.5	"	40 − 70	30 =	28.340	30.005610	0.563670	0.018785
1878, Nov. 12	62	Harkness.	30 − 100	70 =	66.079	70.014280	0.314293	0.018772
						Σ 142.030471	2.666660	

Or, 142.0305 revolutions, at 32° F. = 2.666660 inches; and 1.0000 revolutions, at 32° F. = 0.0187753 inches; (log. 8.2735587).

The probable error of this value is about 0.000002 inches, or $\frac{1}{9388}$th part.

Inequality of Integer Revolutions.—Some light will be thrown on the question as to the inequality of the various whole revolutions by collecting into one table the measures of 1874, January 20, and of 1876, April 29 and May 1, which give the residual corrections required to reduce each whole revolution to the mean of all the whole revolutions from 40^{r} to 90^{r}. The measures were taken at temperatures varying from 70° to 59°.5, but as the effect of 10°.5 change of temperature will only change the value of one revolution by about $0''.0007$, the residual corrections may be considered as comparable.

The data of each day show that the probable error of a single measure, is:

1874, Jan. 20, $0^{r}.0023 = 0''.024$
1876, April 29, $0.0026 = 0.027$
May 1, $0.0023 = 0.023$

We may then assume this probable error when it depends on only one measure as $0''.025$, when on two as $0''.018$. The collection of the individual corrections is made in the following

Table showing the Corrections required to Reduce the Observed Value of each Revolution to the Mean of all.

Revolution r.	Δ 1874, Jan. 20. NEWCOMB.	Δ 1876, Apr. 29. HOLDEN.	Δ 1876, May 1. HOLDEN.	Δ Mean Correction.	Revolution r.	Δ 1874, Jan. 20. NEWCOMB.	Δ 1876, Apr. 29. HOLDEN.	Δ 1876, May 1. HOLDEN.	Δ Mean Correction.
	$''$	$''$	$''$	$''$		$''$	$''$	$''$	$''$
40^{r} to 41^{r}	. . .	. . .	+ 0.011	+ 0.011	65^{r} to 66^{r}	− 0.011	. . .	+ 0.063	+ 0.026
41 to 42	. . .	. . .	− .063	− 0.063	66 to 67	− .042	. . .	+ .032	− 0.005
42 to 43	. . .	. . .	− .011	− 0.011	67 to 68	− .042	. . .	+ .042	0.000
43 to 44	. . .	. . .	.000	0.000	68 to 69	+ .042	. . .	− .042	0.000
44 to 45	. . .	. . .	+ .053	+ 0.053	69 to 70	+ .011	. . .	+ 0.011	+ 0.011
45 to 46	. . .	. . .	+ .011	+ 0.011	70 to 71	+ .011	+ 0.042	. . .	+ 0.027
46 to 47	. . .	. . .	+ .032	+ 0.032	71 to 72	+ .053	− .021	. . .	+ 0.016
47 to 48	. . .	. . .	.000	0.000	72 to 73	− .074	+ .011	. . .	− 0.032
48 to 49	. . .	. . .	− .032	− 0.032	73 to 74	.000	− .021	. . .	− 0.011
49 to 50	. . .	. . .	− .042	− 0.042	74 to 75	− .042	+ .053	. . .	+ 0.006
50 to 51	. . .	. . .	+ .042	+ 0.042	75 to 76	− .011	+ .042	. . .	+ 0.016
51 to 52	. . .	. . .	− .011	− 0.011	76 to 77	− 0.011	− .042	. . .	− 0.027
52 to 53	. . .	. . .	− .021	− 0.021	77 to 78	. . .	+ .011	. . .	+ 0.011
53 to 54	. . .	. . .	− .042	− 0.042	78 to 79	. . .	− .032	. . .	− 0.032
54 to 55	. . .	. . .	+ .042	+ 0.042	79 to 80	. . .	+ .063	. . .	+ 0.063
55 to 56	+ 0.042	. . .	+ .021	+ 0.032	80 to 81	. . .	+ .021	. . .	+ 0.021
56 to 57	− .042	. . .	− .021	− 0.032	81 to 82	. . .	− .021	. . .	− 0.021
57 to 58	− .011	. . .	+ .032	+ 0.011	82 to 83	. . .	+ .011	. . .	+ 0.011
58 to 59	.000	. . .	− .032	− 0.016	83 to 84	. . .	+ .021	. . .	+ 0.021
59 to 60	+ .042	. . .	+ .084	+ 0.063	84 to 85	. . .	. . .	. . .	. . .
60 to 61	+ .074	. . .	− .011	+ 0.037	85 to 86	. . .	. . .	. . .	. . .
61 to 62	− .032	. . .	.000	− 0.016	86 to 87	. . .	.000	. . .	0.000
62 to 63	− .021	. . .	+ .053	+ 0.016	87 to 88	. . .	− .011	. . .	− 0.011
63 to 64	− .011	. . .	− .011	− 0.011	88 to 89	. . .	− .021	. . .	− 0.021
64 to 65	+ .011	. . .	− .084	− 0.037	89 to 90	. . .	+ 0.011	. . .	+ 0.011

In the above table there are 70 single determinations of the length of one revolution, and the probable error of such a determination from the measures of one day is 0″.025 approximately. If the residuals are purely accidental then they should be arranged according to the law of facility of error.

Errors.	Theory.	Fact.
Above 0″.084	1	2
0″.084 to 0″.074	2	2
.074 to .063	2	3
.163 to .053	4	4
.053 to .042	7	16
.042 to .032	10	7
.032 to .021	13	10
.021 to .011	14	20
0.011 to 0.000	17	6

The second column of this table shows the number of errors which should exist between the limits set down in the first column, if we regard these errors as purely accidental and subject to the usual law of facility of error. The third column shows the actual number found.

The agreement between the numbers in columns 2 and 3 is not very close below the limit 0″.053, and the number of observations is too small to allow a very definite inference to be made from this table. We may examine the question in another way. Each of the revolutions may be affected by a constant error, s', s''. . . . s^n $(\Sigma s' = 0)$, and by purely accidental errors, r', r'', r'''. . . . The measures of one day on any revolution give $s' + r'$; on a second day we have $s' + r''$. The mean correction set down in the table is $s' + \frac{1}{2}(r' + r'')$. If we take the half difference of the results of two days instead of their half sum, we should have $\frac{1}{2}(r' - r'')$. If we form $\Sigma \frac{1}{2}(r' + r'')$ and $\Sigma \frac{1}{2}(r' - r'')$, these, in a sufficiently large number of cases, should be zero, and in a limited number of cases they will approach equality with each other. For Screw I $\Sigma \frac{1}{2}(r' + r'') = +0''.037$ and $\Sigma \frac{1}{2}(r' - r'') = -0''.138$ from 22 cases.

The difference, 0″.1, is four times the probable error of a single determination. It expresses the error of the hypothesis $\Sigma s' = 0$ for the 22 revolutions considered, *plus* the error of supposing the 44 residuals to be distributed as they would be in an infinite number of cases.

Again, there are 19 cases between 55^r and 77^r where both the corrections deduced have values different from zero. It is not probable that the signs of these corrections have changed between 1874 and 1876 Out of these 19 cases the signs *agree* in 7 instances and differ in 12. This also seems to show that these corrections are accidental, since we should expect as many as 5 agreements of sign if the residuals are purely due to accident. Even allowing them to be real, it is plain that their effect upon observations will be far below that of the accidental errors of each night.

From the foregoing I conclude that *the screw of Micrometer I is practically perfect and requires no correction for inequalities in the whole revolutions, or for periodic errors.*

Investigation of the Inequalities of the Screw of Micrometer II.—The following observations were made on essentially the same plan as those heretofore described.

The various columns have the meanings given below.

Column 1. Reading of Telescope Micrometer = Micrometer II.

Column 2. Glass scale of engine, corrected.

Column 3. Micrometer (A) of the engine.

During this series the relation $1\ D = 6.592\ R$ was constantly true. All the bisections with Micrometer A were made by turning its screw in an increasing direction. Each reading of Micrometer A here set down is, as with Micrometer I, the mean of 4 separate and independent bisections.

t is the reading of a thermometer laid in the shade under the engine; t' is the reading of a thermometer, which is inserted in the metal work of the box of the Micrometer II, and which forms a part of it. This was (unavoidably) exposed to the direct rays of the sun for very short periods of time, and I have therefore taken t as the true temperature of the screw. This is probably true, as t and t' never differed by as much as 5° F.

Immediately following I give the result of a comparison between the thermometer (t') on the box and the standard thermometer of the Observatory. To reduce the readings of the latter to the Kew standard, the correction $-0^\circ.9$ *Fahr.* is required The observers were the watchmen and meteorological observers of the Observatory.

The thermometer on the box of Micrometer II was exposed for several days in the thermometer-house, and readings of it taken at same time as those of the standard dry-bulb thermometer.

Date.	(Civil) Hour.	Observer.	Therm. of Mic. II. t'	Dry-Bulb Therm. t	Date.	(Civil) Hour.	Observer.	Therm. of Mic. II. t'	Dry-Bulb Therm. t
1876.	h.		°	°	1876.	h.		°	°
March 24	3	Cahill .	43.5	43.6	March 26	6	Cahill .	43.0	42.5
	6	Hays . .	40.5	41.0		9	Cahill .	41.0	41.0
	9	Hays . .	37.0	37.0	27	0	Hays . .	41.0	41.5
25	0	Horigan	38.0	38.6		3	Hays . .	36.5	35.6
	3	Horigan	43.0	43.5		6	Hays . .	35.5	35.3
	6	Horigan	44.0	44.5		9	Horigan	43.5	45.5
	7	Horigan	44.5	45.0		12	Horigan	49.2	50.5
	9	Cahill .	50.5	51.0		3	Horigan	56.8	57.7
	12	Cahill .	52.0	49.5		6	Cahill .	54.0	53.0
	3	Cahill .	48.0	48.5		9	Cahill .	44.0	42.5
	6	Horigan	45.5	45.8	28	0	Hays . .	41.0	40.5
	9	Horigan	42.8	43.		3	Hays . .	36.6	37.0
26	0	Hays . .	41.7	41.8		6	Hays . .	37.0	36.8
	3	Hays . .	38.5	37.5		9	Horigan	38.7	39.4
	6	Hays . .	36.5	36.2		12	Horigan	42.7	43.4
	9	Horigan	40.5	42.5		3	Horigan	44.8	45.9
	12	Horigan	45.3	46.4		6	Cahill .	57.0	57.4
	3	Horigan	47.2	48.7		9	Cahill .	42.0	41.0

The reticle of this micrometer consists of five movable wires and one fixed wire parallel to these. During the observations given below, the coincidences of the various wires with the fixed wire were as in the 2d column:

	r.	r.
Wire 1	85	10.0
2	5	30.0
3	25	50.0
4	45	70.0
5	65	90.0

that is, the middle movable wire of the reticle coincided with the middle fixed wire at 25^{r}. During December, 1876, the reading of the head of the screw was altered, so that when thread 3 was in this position the reading was 50^{r}, and it will remain in this position. (See 3d column.)

All the following measures were made on wire 2 instead of wire 3, as it was more convenient to do this.

In the following tables I have given the reading of Micrometer II, not as it was recorded at the time, but increased by 25^{r}; that is, the readings here set down correspond to the present state of this micrometer.

TABLE.—1876, *April* 11. *Micrometer II.*

Mic. II.	Scale corrected.	Mic. A. rev.	¼ rev. =	Corr'n ν in rev.	Corr'n ν in arc.	Mic. II.	Scale corrected.	Mic. A. rev.	¼ rev. =	Corr'n ν in rev.	Corr'n ν in arc.
r.	D.	R.	D.	D.	"	R.	D.	R.	D.	D.	"
81.00	149.010	40.28	1.53	+0.03	+0.05	75.	153.012	29.39	1.55	+0.01	+0.02
.75	. . .	38.75	.53	+ .03	+ .05	.75	. . .	27.84	.56	.00	.00
.50	. . .	37.22	.55	+ .01	+ .02	.50	. . .	26.28	.55	+ .01	+ .02
.25	. . .	35.67	.58	− .02	− .03	.25	. . .	24.73	.56	.00	.00
80.	. . .	34.09	.55	+ .01	+ .02	74.	. . .	23.17	.55	+ .01	+ .02
.75	. . .	32.54	.52	+ .04	+ .06	.75	. . .	21.62	.54	+ .02	+ .03
.50	. . .	31.02	.56	.00	.00	.50 }	153.012	20.08			
.25	. . .	29.46	.60	− .04	− .06	.50 }	156.013	39.86	1.58	− .02	− .03
79.	. . .	27.86	.51	+ .05	+ .08	.25	. . .	38.28	.58	− .02	− .03
.75	. . .	26.35	.56	.00	.00	73.	. . .	36.70	.51	+ .05	+ .08
.50	. . .	24.79	.58	− .02	− .03	.75	. . .	35.19	.52	+ .04	+ .06
.25	. . .	23.21	.57	− .01	− .02	.50	. . .	33.67	.64:	− .08:	− .13
78.	. . .	21.64	.54	+ .02	+ .03	.25	. . .	32.03	.58	− .02	− .03
.75	. . .	20.10	.56	.00	.00	72.	. . .	30.45	.51	+ .05	+ .08
.50 }	149.010	18.54				.75	. . .	28.94	.56	.00	.00
.50 }	153.012	44.92	1.58	− .02	− .03	.50	. . .	27.38	.52	+ .04	+ .06
.25	. . .	43.34	.54	+ .02	+ .03	.25	. . .	25.86	.59	− .03	− .05
77.	. . .	41.80	.53	+ .03	+ .05	71. }	156.013	24.27			
.75	. . .	40.27	.54	+ .02	+ .03	71. }	159.015	44.09	1.55	+ .01	+ .02
.50	. . .	38.73	.55	+ .01	+ .02	.75	. . .	42.54	.55	+ .01	+ .02
.25	. . .	37.18	.51	+ .05	− .08	.50	. . .	40.99	.56	.00	.00
76.	. . .	35.57	.50	+ .06	+ .10	.25	. . .	39.43	.55	+ .01	+ .02
						70.	. . .	37.88	.58	− .02	− .03
.75	. . .	34.07	.58	− .02	− .03	.75	. . .	36.30	.54	+ .02	+ .03
.50	. . .	32.49	.54	+ .02	+ .03	.50	. . .	34.76	.54	+ .02	+ .03
.25	. . .	30.95	.56	.00	.00	.25	. . .	33.22	.58	− .02	− .03

TABLE.—1876, *April* 11. *Micrometer II*—Continued.

Mic. II.	Scale corrected.	Mic. A. rev.	¼ rev. =	Corr'n ν in rev.	Corr'n ν in arc.
r.	D.	R.	D.	D.	"
69.	159.015	31.64	1.54	+0.02	+0.03
.75	. . .	30.10	.53	+ .03	+ .05
.50	. . .	28.57	.54	+ .02	+ .03
.25	. . .	27.03	.60	− .04	− .06
68.	. . .	25.43	.56	.00	.00
.75	. . .	23.87	.54	+ .02	+ .03
.50	. . .	22.33	.56	.00	.00
.25	. . .	20.77	.56	.00	.00
67.	159.015	19.21			
67.	163.016	45.58			
			APRIL 12.		
67.	163.016	45.52	1.53	+0.03	+0.05
.75	. . .	43.99	.52	+ .04	+ .06
.50	. . .	42.47	.58	− .02	− .03
.25	. . .	40.89	.57	− .01	− .02
66.	. . .	39.32	.55	+ .02	+ .03
.75	. . .	37.77	.57	− .01	− .02
.50	. . .	36.20	.53	+ .03	+ .05
.25	. . .	34.67	.59	− .03	− .05
65.	. . .	33.08	.56	.00	.00
.75	. . .	31.52	.56	.00	.00
.50	. . .	29.96	.52	+ .04	+ .06
.25	. . .	28.44	.59	− .03	− .05
64.	. . .	26.85	.53	+ .03	+ .05
.75	. . .	25.32	.58	− .02	− .03
.50	. . .	23.74	.55	+ .01	+ .02
.25	. . .	22.19	.58	− .02	− .03
63.	163.016	20.61			
63.	167.018	47.10	1.58	− .02	− .03
.75	. . .	45.52	.57	− .01	− .02
.50	. . .	43.95	.53	+ .03	+ .05
.25	. . .	42.43	.57	− .01	− .02
62.	. . .	40.86	.54	+ .02	+ .03
.75	. . .	39.32	.56	.00	.00
.50	. . .	37.76	.57	− .01	− .02
.25	. . .	36.19	.55	+ .01	+ .02
61.	. . .	34.64	.54	+ .02	+ .03
.75	. . .	33.10	.57	− .01	− .02
.50	. . .	31.53	.55	+ .01	+ .02
.25	. . .	29.98	.56	.00	.00
60.	. . .	28.42	.55	+ .01	+ .02
.75	. . .	26.87	.53	+ .03	+ .05
.50	. . .	25.34	.58	− .02	− .03
.25	. . .	23.76	.56	.00	.00
59.	. . .	22.20	.54	+ .02	+ .03
.75	167.018	20.66			
.75	170.019	40.46	1.58	− .02	− .03
.50	. . .	38.88	.55	+ .01	+ .02
.25	. . .	37.33	.57	− .01	− .02
58.	. . .	35.76	.57	− .01	− .02
.75	. . .	34.19	.56	.00	.00
.50	. . .	32.63	.55	+ .01	+ .02
.25	. . .	31.08	.57	− .01	− .02
57.	170.019	29.51	1.54	+0.02	+0.03
.75	. . .	27.97	.58	− .02	− .03
.50	. . .	26.39	.55	+ .01	+ .02
.25	. . .	24.84	.59	− .03	− .05
56.	. . .	23.25	.53	+ .03	+ .05
.75	170.019	21.72			
.75	173.019	41.55	1.55	+ .01	+ .02
.50	. . .	40.00	.54	+ .02	+ .03
.25	. . .	38.46	.58	− .02	− .03
55.	. . .	36.88	.59	− .03	− .05
.75	. . .	35.29	.52	+ .04	+ .06
.50	. . .	33.77	.54	+ .02	+ .03
.25	. . .	32.23	.58	− .02	− .03
54.	. . .	30.65	.52	+ .04	+ .06
.75	. . .	29.13	.54	+ .02	+ .03
.50	. . .	27.57	.57	− .01	− .02
.25	. . .	26.00	.54	+ .02	+ .03
53.	. . .	24.46	.56	.00	.00
.75	. . .	22.90	.57	− .01	− .02
.50	173.019	21.43			
.50	176.019	41.10	1.55	+ .01	+ .02
.25	. . .	39.55	.56	.00	.00
52.	. . .	37.99	.57	− .01	− .02
.75	. . .	36.42	.54	+ .02	+ .03
.50	. . .	34.88	.58	− .02	− .03
.25	. . .	33.30	.55	+ .01	+ .02
51.	. . .	31.75	.56	.00	.00
.75	. . .	30.19	.54	+ .02	+ .03
.50	. . .	28.65	.53	+ .03	+ .05
.25	. . .	27.12	.57	− .01	− .02
50.	. . .	25.55	.57	− .01	− .02
.75	. . .	23.98	.55	+ .01	+ .02
.50	176.019	22.43			
.50	180.020	48.75	1.56	.00	.00
.25	. . .	47.19	.58	− .02	− .03
49.	. . .	45.61	.51	+ .05	+ .08
.75	. . .	44.10	.59	− .03	− .05
.50	. . .	42.51	.53	+ .03	+ .05
.25	. . .	40.98	.57	− .01	− .02
48.	. . .	39.41	.54	+ .02	+ .03
.75	. . .	37.87	.54	+ .02	+ .03
.50	. . .	36.33	.57	− .01	− .02
.25	. . .	34.76	.53	+ .03	+ .05
47.	. . .	33.23	.56	.00	.00
.75	. . .	31.67	.56	.00	.00
.50	. . .	30.11	.53	+ .03	+ .05
.25	. . .	28.58	.57	− .01	− .02
46.	. . .	27.01	.54	+ .02	+ .03
.75	. . .	25.47	.55	+ .01	+ .02
.50	. . .	23.92	.57	− .01	− .02
.25	. . .	22.35	1.56	0.00	0.00
45.	180.020	20.79			
		Mean .	1.5553		

From the above measures it follows that 1 rev. (= 9''.93 approximately) is equal to 6.22 *R*, or 1 *R* = 1''.596. By this relation the residuals *v* (*corrections*) are turned into arc. Collecting these residuals for each quarter of a revolution, we have the following

Table.

Rev. Mic. II.	I. 0r.00 to 0r.25.	II. 0r.25 to 0r.50.	III. 0r.50 to 0r.75.	IV. 0r.75 to 0r.00.
	"	"	"	"
81r. to 80r.	−0.03	+0.02	+0.05	+0.05
80. 79.	− 6	0	+ 6	+ 2
79. 78.	− 2	− 3	0	+ 8
78. 77.	+ 3	− 3	0	+ 3
77. 76.	− 8	+ 2	+ 3	+ 5
76. 75.	0	+ 3	− 3	+ 10
75. 74.	0	+ 2	0	+ 2
74. 73.	− 3	− 3	+ 3	+ 2
73. 72.	− 3	− 13	+ 6	+ 8
72. 71.	− 5	+ 6	0	+ 8
71. 70.	+ 2	0	+ 2	+ 2
70. 69.	− 3	+ 3	+ 3	− 3
69. 68.	− 6	+ 3	+ 5	+ 3
68. 67.	0	0	+ 3	0
67. 66.	− 2	− 3	+ 6	+ 5
66. 65.	− 5	+ 5	− 2	+ 3
65. 64.	− 5	+ 6	0	0
64. 63.	− 3	+ 2	− 3	+ 5
63. 62.	− 2	+ 5	− 2	− 3
62. 61.	+ 2	− 2	0	+ 3
61. 60.	0	+ 2	− 2	+ 3
60. 59.	0	− 3	− 5	+ 2
59. 58.	− 2	+ 2	− 3	+ 3
58. 57.	− 2	+ 2	0	− 2
57. 56.	− 5	+ 2	− 3	+ 3
56. 55.	− 3	+ 3	+ 2	+ 5
55. 54.	− 3	+ 3	+ 6	− 5
54. 53.	+ 3	− 2	+ 3	+ 6
53. 52.	0	+ 2	− 2	0
52. 51.	+ 2	− 3	+ 3	− 2
51. 50.	− 2	+ 5	+ 3	0
50. 49.	− 3	0	+ 2	− 2
49. 48.	− 2	+ 5	− 5	+ 8
48. 47.	+ 5	− 2	+ 3	+ 3
47. 46.	− 2	+ 5	0	0
46. to 45.	0	− 2	+ 2	+ 3
Σ	−0.63	−0.31	+0.46	+0.93
No. of obs.	35	35	35	35
Mean corr.	−0.0180	−0.0089	+0.0131	+0.0266
	I.	II.	III.	IV.

From this table it appears that from 45 to 81 revolutions, inclusive, the mean corrections required to reduce each quarter of a revolution to the mean of all the quarter revolutions are,

	r.		r.	"	
For I.	0.00	to	0.25	— 0.0180	(35 obs.)
For II.	0.25	to	0 50	— 0.0089	"
For III.	0.50	to	0.75	+ 0.0131	"
For IV.	0.75	to	0.00	+ 0.0266	"

$$\Sigma = +0''.0128$$

These corrections are somewhat larger than the corresponding ones for Micrometer I, and they have been determined from nearly three times as many observations. I am inclined to regard not only the *signs* of these residuals as correct, but the values also I consider to be a close approximation. At the same time the absolute magnitude of these corrections is so small that in the practical use of this screw they may safely be neglected. We may say,

The periodic inequalities of Screw I from 45^r *to* 81^r *are far less than the accidental errors of the measures which will be made with it, and they need not be further considered.*

Inequalities of the integer revolutions of Screw II, and absolute length of one revolution in inches.—The observations for this purpose were made on April 11, 12, and 13, 1876, and are entirely similar to those heretofore described in regard to Micrometer I, except that, in this case, all readings of Micrometer A *greater* than 30^r, as $(30 + N)$ for example, give the correction $-N$ to the scale reading of the engine, and all readings less than 30^r, as $(30-N)$, give the correction $+N$ to the scale readings; that is, when the engine was set on an integer scale reading, the Micrometer A read 30^r. It is necessary to state this in order to understand the readings of April 11 already detailed. The observations are here given reduced.

1876, *April* 11. *Micrometer II.* *Observer*, HOLDEN.

Mic. II.	Scale of engine (corrected).	Scale + Mic. A.	Δ 1 rev. =	ν in rev.	ν in arc.
r.	D.	D.	D.	D.	"
81.00	149.010	147.450	0.939	+ 0.004	+ 0.04
80.	. . .	8.389	.946	— .003	— .03
79.	. . .	9.335	.943	.000	.00
78.	. . .	150.278	.944	— .001	— .01
77.	153.012	151.222	.945	— .002	— .02
76.	. . .	2.167	.938	+ .005	+ .05
75.	. . .	3.105	.943	.000	.00
74.	[*t*=68°.0; *t′*=69°.0]	4.048	.951	— .008	— .08
73.	156.013	4.997	.948	— .005	— .05
72.	. . .	5.945	.935	+ .008	+ .08
71.	[*t*=68°.0; *t′*=73°.5]	6.882			
		[.880]			
71.	159.015	6.877	.339	+ .004	+ .04
70.	. . .	7.819	.947	— .004	— .04
69.	. . .	8.766	.942	+ .001	+ .01
68.	. . .	9.708	.944	— 0.001	— 0.01
67.	. . .	160.652			
67.	163.016	160.652			

1876, *April* 12. *Micrometer II.* *Observer*, Holden.

Mic. II.	Scale of engine.	Scale + Mic. A.	Δ 1 rev.	ν in division.	ν in arc.
r.	D.	D.	D.	D.	″
67.	163.016	160.661	0.941	+ 0.002	+ 0.02
66.	[t=67°.0; t'=71°.5]	1.602	.947	− .005	− .05
65.	. . .	2.549	.945	− .002	− .02
64.	. . .	3.494	.939	+ .004	+ .04
63.	. . .	4.441 [.433]			
63.	167.018	4.424	.937	+ .006	+ .06
62.	[t=67°.5; t'=71°.0]	5.370	.944	− .001	− .01
61.	. . .	6.314	.944	− .001	− .01
60.	. . .	7.258	.943	.000	.00
59.	170.019	8.201	.944	− .001	− .01
58.	. . .	9.145	.948	− .005	− .05
57.	. . .	170.093	.950	− .007	− .07
56.	173.019	1.043	.932	+ .011	+ .11
55.	. . .	1.975	.945	− .002	− .02
54.	. . .	2.920	.939	+ .004	+ .04
53.	176.019	3.859	.937	+ .006	+ .06
52.	. . .	4.806	.948	− .005	− .05
51.	. . .	5.754	[.930]	[+ .013]	[+ .14]
50.	180.020	6.684	[.968]	[− .025]	[− .26]
49.	. . .	7.652	.940	+ .003	+ .03
48.	. . .	8.592	.938	+ .005	+ .05
47.	. . .	9.530	.944	− .001	− .01
46.	. . .	180.474	.943	.000	.00
45.	. . .	1.417	[.960]	[− .017]	[− .18]
44.	184.020	2.377	[.932]	[+ .011]	[+ .11]
43.	. . .	3.309	.949	− .006	− .06
42.	. . .	184.258	.944	− .001	− .01
41.	. . .	5.202	.947	− .004	− .04
40.	188.020	6.149	.936	+ .007	+ .07
39.	. . .	7.085	.944	− .001	− .01
38.	. . .	8.029	.944	− .001	− .01
37.	. . .	8.973			
37.	191.021	8.974	.940	+ .003	+ .03
36.	. . .	9.914	.945	− .002	− .02
35.	. . .	190.859	0.943	0.000	0.00
34.	. . .	191.804			

1876, *April* 13. *Micrometer II.*

Mic. II.	Scale (corrected)	Mic. A.	Mic. A.	Scale + Mic. A.	⦣ 1 rev. =	ν in division.	ν in arc.
r.	D.	R.	D.	D.	D.	D.	"
85.	144.008	− 2.107	− 0.320	143.688	0.936	+ 0.007	+ 0.07
84.	[t=69°.0]	+ 4.057	+ 0.616	144.624	.946	− .003	− .03
83.	. . .	+ 10.280	+ 1.560	5.568 [.570]			
83.	148.010	− 16.068	− 2.438	5.572	.944	− .001	− .01
82.	. . .	− 9.858	− 1.496	6.514	.944	− .001	− .01
81.	. . .	− 3.641	− 0.552	7.458	.943	.000	.00
80.	. . .	+ 2.579	+ 0.391	8.401	.951	− .008	− .08
79.	. . .	+ 8.847	+ 1.342	9.352	.943	.000	.00
78.	. . .	+ 15.020	+ 2.279	150.289 [.295]			
78.	152.012	− 11.284	− 1.711	150.301	.942	+ .001	+ .01
77.	. . .	− 5.108	− 0.775	1.237	.940	+ .003	+ .03
76.	. . .	+ 1.094	+ 0.165	2.177	.947	− .003	− .03
75.	. . .	+ 7.327	+ 1.112	3.124	.942	+ .001	+ .01
74.	. . .	+ 13.535	+ 2.053	4.065 [.066]			
74.	156.013	− 12.829	− 1.946	4.067	.941	− .001	− .01
73.	. . .	− 6.618	− 1.003	5.010	.945	− .002	− .02
72.	. . .	− 0.380	− 0.058	5.955	.942	+ .001	+ .01
71.	. . .	+ 5.827	+ 0.884	6.897	.947	− .004	− .04
70.	. . .	+ 12.039	+ 1.827	7.840 [.844]			
70.	160.015	− 14.287	− 2.168	7.847	.942	+ .001	+ .01
69.	. . .	− 8.101	− 1.229	8.786	.941	+ .002	+ .02
68.	. . .	− 1.904	− 0.288	9.727	.942	+ .001	+ .01
67.	. . .	+ 4.314	+ 0.654	160.669	.943	.000	.00
66.	. . .	+ 10.536	+ 1.599	1.614			
66.	164.016	− 15.826	− 2.402	1.614	.931*	+ .012	+ .13
65.	. . .	− 9.630	− 1.461	2.545	.954*	− .011	− .12
64.	. . .	− 3.413	− 0.517	3.499	.940	+ .003	+ .03
63.	. . .	+ 2.793	+ 0.423	4.439	.944	− .001	− .01
62.	. . .	+ 9.011	+ 1.367	5.383	.943	.000	.00
61.	. . .	+ 15.219	+ 2.309	6.325			
61.	168.018	− 11.146	− 1.692	6.326	.938	+ .005	+ .05
60.	. . .	− 4.972	− 0.754	7.264	.944	− .001	− .01
59.	. . .	+ 1.254	+ 0.190	8.208	0.943	0.000	0.00
58.	. . .	+ 7.468	+ 1.133	169.151			

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* The original observations of these appear to be correct, but there is no doubt an error here, as is shown by the residuals $+ 0^{D}.012$, $- 0^{D}.011$. I have not, however, rejected these.

1876, *April* 15. *Micrometer II.*

Mic. II.	Scale of engine (corrected).	Δ 1 rev. =	ν in division.	ν in arc.	Mic. II.	Scale of engine (corrected).	Δ 1 rev. =	ν in division.	ν in arc.
r.	D.	D.	D.	"	r.	D.	D.	D.	"
34.	191.801	0.945	− 0.002	− 0.02	60.	167.293	0.941	+ 0.002	+ 0.02
35.	190.856	.947	− .004	− .04	61.	6.352	.939	+ .004	+ .04
36.	189.909	.945	− .002	− .02	62.	5.413	.947	− .004	− .04
37.	8.964	.936	+ .007	+ .07	63.	4.466	.939	+ .004	+ .04
38.	$t=70°.5$ } 8.028	.948	− .005	− .05	64.	3.527	.944	− .001	− .01
	$t'=75°.0$ }				65.	2.583	.968	− .025	[− .26]
39.	7.080	.942	+ .001	+ .01	66.	1.615	.942	+ .001	+ .01
40.	6.138	.943	.000	.00	67.	160.673	.946	− .003	− .03
41.	5.195	.944	− .001	− .01	68.	159.727	.942	+ .001	+ .01
42.	4.251	.942	+ .001	+ .01	69.	8.785	.941	+ .002	+ .02
43.	3.309	.950	− .007	+ .07	70. }	7.847 }			
44.	2.359	.940	+ .003	+ .03		[.844]			
45.	1.419	.944	− .001	− .01	70. }	7.840 }	.940	+ .003	+ .03
46.	180.475	.940	+ .003	+ .03	71.	6.900	.945	− .002	− .02
47.	179.535	.947	− .004	− .04	72.	5.955	.942	+ .001	+ .01
48.	8.568	.940	+ .003	+ .03	73.	5.013	.947	− .004	− .04
49. }	$t=71°.3$ } 7.649 }				74.	4.066	.939	+ .004	+ .04
	[.648]				75.	3.127	.942	+ .001	+ .01
49. }	$t'=75°.5$ } 7.647 }	.943	.000	.00	76.	2.185	.944	− .001	− .01
50.	6.705	.946	− .003	− .03	77.	1.241	.945	− .002	− .02
51.	5.759	.943	.000	.00	78.	150.296	.940	+ .003	+ .03
52.	4.816	.944	− .001	− .01	79.	119.356	.944	− .001	− .01
53.	3.872	.937	+ .006	+ .06	80.	8.412	.945	− .002	− .02
54.	2.935	.945	− .002	− .02	81.	7.467	.912	+ .001	+ .01
55.	1.990	.946	− .003	− .03	82.	6.525	.939	+ .004	+ .04
56.	1.044	.945	− .002	− .02	83.	5.586	.944	− .001	− .01
57.	170.099	.942	+ .001	+ .01	84.	4.642	0.938	+ 0.005	+ 0.05
58.	169.157	.945	− .002	− .02	85.	143.704			
59.	8.212	.919	+ .024	[+ .25]					

Further measures were also made, as below:

1878. *November* 11. *Micrometer II.* *Observer*, HARKNESS. $t = 40°.5$.

Mic. II.	Scale on Fixed wire.	Scale on Mov. wire 3.	Δ	20 rev. =	
r.	D.			D.	
0.00	191.159	143.897	−47.262	18.871	Therefore, 20 rev. (between 0^r and 80^r) = $18^D.8668$ at 60°.5.
20.00	.163	162.772	−28.391	18.869	
40.00	.163	181.641	− 9.522	18.866	
60.00	.162	200.506	+ 9.344	18.861	
80.00	.163	219.368	+28.205	[18.996]	
100.00	191.167	238.368	+47.201		

1878, *November* 12. *Micrometer II.* *Observer*, HARKNESS. $t = 67°$.

Mic. II.	Scale on Fixed wire.	Scale on Mov. wire 3.	Δ	20 rev. =	
r.	D.			D.	
100.00	191.169	238.348	+47.179	[9.542]	40 rev. at 67° (between 0ʳ and 80ʳ) = 37ᴰ.7330.
90.00	.180	228.817	+37.637	[9.432]	
80.00	.179	219.384	+28.205	37.729	
40.00	.179	181.655	− 9.524	37.737	
0.00	191.178	143.917	−47.261		

These observations, together with the preceding series, show that this screw has a uniform revolution between 0ʳ — 80ʳ. It is used only between these limits Above 80ʳ it appears to be irregular. If at any future time this micrometer screw is used in the part between 80–100 revolutions, the data here given will be useful. They are set down for that reason, but I have only considered this screw between 0ʳ–80ʳ.

Length of the Mean Revolution of Micrometer II (0 *to* 80 *revolutions*), *in inches, at* 32° *F.*—From the preceding measures I have collected those observations which refer to that part of the screw between 0 and 80 revolutions and reduced them in the following table precisely as in the case of Screw I.

Date.	Temp.	Observer.	Limiting revolutions Mic. II.	No of revs. Mic. II.	No. of scale divisions.	No. of revs. of Mic. II at 32° F.	No. of inches at 32° F.	1 rev. at 32° F.
1876.				r.	d.	r.	in.	in.
April 11	68	HOLDEN . .	67 — 80	13. =	12.263	13.003182	0.243916	0.018758
April 12	68	"	34 — 67	33. =	31.143	33.008078	0.619446	.018766
April 13	69	"	58 — 80	22. =	20.750	22.005535	0.412727	.018756
April 15	71	"	34 — 80	46. =	43.389	46.012199	0.863036	.018757
1878.								
Nov. 11	60.5	HARKNESS .	0 — 80	80. =	75.471	80.015232	1.501081	.018760
Nov. 12	67	"	0 — 80	80. =	75.467	80.019040	1.501051	0.018759
						Σ274.063266	5.141257	

or 274.0633 revolutions at 32° F. = 5.141257 inches, and 1.0000 revolutions at 32° F. = 0.0187594 inches (log 8.273218). The probable error of this result is not above 0.000001 inches, or $\frac{1}{19{,}000}$th part.

Inequality of Integer Revolutions.—As in the case of Screw I, I have collected into one table the residual corrections required to reduce each individual revolution to the mean of all observed on the same day.

Table showing the Corrections required to Reduce the Observed Value of each Revolution to the Mean of all.

Micrometer II.		Δ	Δ	Δ	Δ	Mean
From	To	April 11.	April 12.	April 13.	April 15.	correction.
r.	r.	"	"	"	"	"
34.0 to	35.0	. .	0.00	. .	− 0.02	− 0.010
35.	36.	. .	− .02	. .	− .04	− .030
36.	37.	. .	+ .03	. .	− .02	+ .005
37.	38.	. .	− .01	. .	+ .07	+ .030
38.	39.	. .	− .01	. .	− .05	− .030
39.	40.	. .	+ .07	. .	+ .01	+ .040
40.	41.	. .	− .04	. .	.00	− .020
41.	42.	. .	− .01	. .	− .01	− .020
42.	43.	. .	− .06	. .	+ .01	− .025
43.	44.	. .	[+ .11]	. .	− .07	− .035
44.	45.	. .	[− .18]	. .	+ .03	+ .015
45.	46.	. .	.00	. .	− .01	− .005
46.	47.	. .	− .01	. .	+ .03	+ .010
47.	48.	. .	+ .05	. .	− .04	+ .005
48.	49.	. .	+ .03	. .	+ .03	+ .030
49.	50.	. .	[− .26]	. .	.00	.000
50.	51.	. .	[+ .14]	. .	− .03	− .030
51.	52.	. .	− .05	. .	.00	− .025
52.	53.	. .	+ .06	. .	− .01	+ .025
53.	54.	. .	+ .04	. .	+ .06	+ .050
54.	55.	. .	− .02	. .	− .02	− .020
55.	56.	. .	+ .11	. .	+ .03	+ .040
56.	57.	. .	− .07	. .	− .02	− .045
57.	58.	. .	− .05	. .	+ .01	− .020
58.	59.	. .	− .01	0.00	− .02	− .010
59.	60.	. .	.00	− .01	[+ .25]	− .005
60.	61.	. .	− .01	+ .05	+ .02	+ .020
61.	62.	. .	− .01	.00	+ .04	+ .010
62.	63.	. .	+ .06	− .01	− .04	+ .003
63.	64.	. .	+ .04	+ .03	+ .04	+ .037
64.	65.	. .	− .02	− .12	− .06	− .050
65.	66.	. .	− .05	+ .13	[− .26]	+ .040
66.	67.	. .	+ 0.02	.00	+ .01	+ .010
67.	68.	− 0.01	. .	+ .01	− .03	− .010
68.	69.	+ .01	. .	+ .02	+ .01	+ .013
69.	70.	− .04	. .	+ .01	+ .02	− .003
70.	71.	+ .04	. .	− .04	+ .03	+ .010
71.	72.	+ .08	. .	+ .01	− .02	+ .023
72.	73.	− .05	. .	− .02	+ .01	− .020
73.	74.	− .08	. .	− .01	− .04	− .043
74.	75.	.00	. .	+ .01	+ .04	+ .017
75.	76.	+ .05	. .	− .03	+ .01	+ .010
76.	77.	− .02	. .	+ .03	− .01	.000
77.	78.	− .01	. .	+ .01	− .02	− .007
78.	79.	.00	. .	.00	+ .03	+ .010
79.0	80.0	− 0.03	. .	− 0.08	− 0.01	− 0.040
80.0	81.0	+ 0.04	. .	0.00	− 0.02	+ 0.007
81.	82.	. .	. .	− .01	+ .01	.000
82.	83.	. .	. .	− .01	+ .04	+ .015
83.	84.	. .	. .	− .03	− .01	− .020
84.0	85.0	. .	. .	+ 0.07	+ 0.05	+ 0.060

From the data of the different days' measures, it follows that the probable errors of the determination of the length of a single revolution of Screw II as referred to the mean of all the measures of that day, were:

For April	11,	0″.097 (very few observations).
	12,	0.031
	13,	0.031
	15,	0.040

Omitting April 11, we may fairly assume that the probable error of the value of each revolution from each day's measures is as much as ± 0″.034.

Therefore, the probable errors of the concluded values of each revolution, when these depend upon the observations of two days, is 0″.024; and when they depend upon the observations of three days, is 0″.016.

Omitting the small number of observations of April 11, there are in the above table 111 single determinations of the value of a revolution. The probable error of each determination from the measures of a single day is 0″.034.

Errors.		Theory.	Fact.
	″ ″		
Over	0.10	6	9
From	0.10 to 0.09	3	0
	.09 to .08	4	1
	.08 to .07	6	5
	.07 to .06	8	4
	.06 to .05	10	7
	.05 to .04	12	12
	.04 to .03	14	14
	.03 to .02	15	16
	.02 to .01	16	32
	0.01 to 0.00	17	11

In the table above, the second column shows the number of errors which should fall between the limits named in the first column, provided that the errors in question are purely accidental. The third column shows the actual number found. Although the agreement of the two columns is not very good, it indicates that the residuals in the table follow the law of accidental errors.

The table includes also the residuals between 80^r and 85^r, although we know that somewhere between 80^r and 90^r the length of one revolution changes. It was computed before this was discovered, and a recomputation can only make the following conclusions more certain.

As in the case of Screw I, I conclude that the corrections to each revolution previously tabulated (between 0^r to 80^r only) are not real, but arise from accidental errors only. Even admitting them to be real, they are of so little magnitude as to fall far below the accidental errors of the measures which will be made with this screw.

It may then be said that *the Screw II between 0^r and 80^r is practically perfect, and requires no correction for inequalities of whole revolutions, nor for periodic error.*

Observations for the Determination of the Value of One Revolution of the Screw of Micrometer I in Arc.—This micrometer has been in use from November 20, 1873, to the present time. Observations to determine the value of one revolution of its screw have been made at various dates and by different methods. These are:

I. Observations of transits of equatorial and zenith stars.
II. " " northern stars.
III. " " *Polaris.*
IV. " differences of declination of stars in the *Pleiades.*
V. " the difference of declination of ι and *c Orionis.*
VI. Measures of focal length of the objective.

The equatorial being mounted in a steel tube, and the screw being of steel, the temperature coefficient will be zero. The observations show this also.

I. The observations of the transits of equatorial and zenith stars, summarized in the following table, were at first taken when no other work was to be done, and therefore frequently in unfavorable conditions of the atmosphere. (1 signifies very unsteady images, 3 average steadiness, and 5 perfect steadiness of images.) τ is the hour angle of the stars employed, at the middle time; t is the observed interval in seconds of time required for the star to pass from wire 1 (which was arbitrarily set at any desired revolution) to wire 2, which was fixed; m is the distance of these wires in revolutions.

The transits were all observed by means of a chronograph, and, except the last two, over bright wires in a dark field, as no satisfactory illumination of the field was available until after 1876, March 13.

The weight of the separate values of one revolution of the screw has been assumed as (nearly) proportional to the product of the number of observations of t, the number expressing the *steadiness* of the image and the square of the observed interval. The observations have been reduced by the formula $r = \frac{f}{m} + \frac{k}{m}$*,

$f = 15 . t . \cos\delta$; $k = \rho . \sin 1'' . f . \sec^2\psi$; $\tan\psi = \text{cotang} . n . \text{cosec}\,(\delta + N)$.
in which

r = value of one revolution in seconds of arc;
m = interval in revolutions between wires 1 and 2;
t = interval in time between wires 1 and 2;
δ = average apparent declination of the stars employed;
ρ = the constant of refraction.

The value of $\tan\psi$ was taken from the auxiliary table annexed, which is computed for latitude 38° 53′ 39″.

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* See HANSEN *Astronomische Nachrichten*, ii, col. 407.

Value of 1 *rev. of Micrometer I, from Transits.*

Date.	Observer.	Eye-piece.	Stars employed.	τ	t	m	1 rev. =	Wt. =	No. of transits.	State of image.	Temp. Fahr.
1874.				h. m.	s.	r.	″				°
Dec. 4*	NEWCOMB	600 A	23, 26, 27, 34 Pleiadum	23 5	17.592	24.273	9.949	2	27	1	.
4*	NEWCOMB	600 A	23, 26, 27, 34 Pleiadum	23 5	39.021	53.912	.936	8	27	1	.
1875.											
Jan. 4*	HOLDEN .	600 A	23, 26, 27, 34 Pleiadum	23 50	17.611	24.270	.961	3	55	1	33
14*	HOLDEN .	600 A	Nos. 685, 708, 709, 741 of G. P. BOND's Catalogue of Stars in the Nebula of Orion.	0 5	16.147	24.270	.930	2	32	1	30
22*	HOLDEN .	600 A		23 3	16.155	24.270	.935	6	99	1	47
26*	HOLDEN .	600 A		0 5	16.176	24.265	.950	11	96	2	24
Feb. 1*	HOLDEN .	600 A		23 28	16.179	24.271	.950	15	128	2	30
4*	HOLDEN .	600 A		23 0	16.137	24.258	.929	3	57	1	22
5*	HOLDEN .	600 A		23 30	16.169	24.268	.945	13	109	2	24.5
May 11*	HOLDEN .	600 A	D. M. + 0° ; 3264–5 .	22 50	16.121	24.281	.956	7	62	2	64
17*	HOLDEN .	600 A	D. M. + ρ° ; 3264–5 .	22 14	16.092	24.276	.940	20	88	4	55
1876.											
Mar. 13†	HOLDEN .	600 A	D. M. – 0° ; 2349–50 .	0 35	39.063	58.898	.945	25	24	3	33.5
1877.											
Jan. 2†	HOLDEN .	400	685, etc., Orionis . .	22 47	19.373	29.118	.931	9	52	2	16.5
Oct. 17†	HOLDEN .	400 B	23, 26, 27, 34 Pleiadum	20.47	18.699	25.755	9.963	22	108	3	56.8
									Σ (964)		

* Dark field. † Bright field.

Date.	Observer.	Eye-piece.	Stars employed.	τ	t	m	1 rev. =	Wt. =	No. of transits.	State of image.	Temp. Fahr.
1877.											
Dec. 14	HALL . .	400 A	36 (H.) Cassiopeæ . .	23 47	61.04	28.000	9.945	1	8	3	37.5
15	HALL . .	400 A	36 (H.) Cassiopeæ . .	23 14	61.05	28.000	9.947	1	8	2	45.5
									Σ (16)		

NOTE.—The mean of the numbers in the column t is about 20^{r}.

The value of one revolution of this screw from the 964 transits of equatorial stars is 9″.9465 ± 0″.0018. For reasons previously stated no term dependent on the temperature is introduced.

II. A few transits were observed by Professor HALL in 1877 which give $r_1 = 9''.946$. It is to be feared that an instrument so large as the 26-inch equatorial will not remain perfectly steady in right ascension when allowed to remain unclamped, and hence the intervals in time, during which it was required to remain fixed, were usually taken small, or *m* was taken small.

III. The few transits of *Polaris* were taken on the nights of 1877, March 23 and 24, giving the values of one revolution 9″.956 and 9″.974 from the separate nights, but it was considered doubtful whether any advantage would be gained by continuing these observations, as the instrument is required to remain fixed for an interval of 9 or 10 minutes, and these observations, which were merely tentative, are not used.

IV. Observations of the difference of declination of *Atlas* and *Pleione* in the Pleiades were made as below:

Date.	Observer.	Observed $\Delta\delta$ revolutions.	Value of 1 revolution.	No. of measures.	Probable error of the mean.
		r.	″		″
1876, Dec. 5	HOLDEN .	30.1975	9.939	10	± 0.004
19	"	.2184	.931	10	0.004
1877, Feb. 7	HALL . .	.1957	.939	6	0.004

The distance in declination of the two stars I assume from an unpublished reduction of positions in the *Pleiades*, by Professor NEWCOMB, U. S. N., to be 300″.21. The differential refraction is 0″.09 in each case. The value of one revolution of this screw from observations of the difference of declination of *Atlas* and *Pleione* is 9″.936 ± 0″.002. This result has relatively small weight as the distance (5′) is too small for the method to be used with advantage, while this distance is as large as can be conveniently measured with any of the eye-pieces (magnifying 400 diameters and upward) whose fields of view are less than 8′–10′.

V. A method was proposed to me by Professor NEWCOMB which is free from these objections, and which must, I think, be regarded as one of the best methods for determining the value of a screw. It consists in measuring the difference of declination between two standard stars 1° or more apart, by means of intermediate small stars.

It is necessary to select as terminal stars two whose places have been fixed by meridian observations. For this purpose I selected *ι* (44) and *c* (42) *Orionis*, whose distance in declination is about 3858″ = 387 revolutions of the screw of Micrometer I. An error of 1″ in the relative places of these two stars and in the eight bisections which it was necessary to make between the two, will affect the final value of the revolution by only $\frac{1}{387}$″.

The intermediate stars used were selected from G. P. BOND'S "Catalogue of Stars in the Nebula of Orion."* They are:

Star.	G. P. B.'s number.	Approx. $\Delta\alpha$ with θ Orionis.	Approx. $\Delta\delta$ with θ Orionis.	Mag.
		m. s.	″	
ι Orionis. .	715	+ 0 11.3	− 1873	5
a . . .	170	− 1 45.4	− 1335	9
b . . .	246	− 1 20.5	− 794	9
c . . .	335	− 0 56.8	− 239	10.9
d . . .	449	− 0 33.0	+ 290	10.5
e . . .	554	− 0 10.9	+ 666	9.0
f . . .	638	+ 0 0.7	+ 1171	9.3
g . . .	852	+ 0 42.8	+ 1645	9.8
42 Orionis. .	672	+ 0 4.9	+ 1986	6.0

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* Annals of Harvard College Observatory, vol. v, p. 70.

As it may be convenient to others using this method and these stars, I add the programme which was followed each night. It is necessary to say, however, that the construction of Micrometer I required that the *preceding* star of each pair should be bisected by the fixed wire, and the *following* star by the micrometer wire:

Programme.

I. (Micrometer head below.) Observe coincidence of wires and the temperature of the micrometer box.
II. Fixed wire on *a*, micrometer wire on *b*; *b* following 25^s;
III. " *b*, " *c*; *c* " 24^s.;
IV. " *c*, " *d*; *d* " 24^s;
V. " *d*, " *e*; *e* " 22^s;
VI. " *e*, " *f*; *f* " 10^s;
VII. " *f*, " *g*; *g* " 42^s;
VIII. Reverse micrometer;
IX. Fixed wire on 42 *Orionis*, micrometer wire on *g*; *g* following 38^s;
X. " *a*, " *ι Orionis*; *ι* following 1^m 57^s;
XI. Observe coincidence of wires and note the temperature.

Five $\Delta\delta$'s were observed in each set, *i. e.*, for each pair of stars, and the time of the first and last bisection of each set was noted.

The observations in detail are to be found in the Washington Astronomical Observations for 1877. The mean results are given in the following table:

Pair of stars.	1877, January 26.				1877, January 27.				1877, January 30.			
	Observed $\Delta\delta$.	τ.	Refr.	Temp.	Observed $\Delta\delta$.	τ.	Refr.	Temp.	Observed $\Delta\delta$.	τ.	Refr.	Temp.
	r.	h. m.	"	°	r.	h. m.	"	°	r.	h. m.	"	°
ι—a	54.128	+1 41	0.329	28.5	54.238	−0 18	0.299	40	54.245	−0 18	0.299	41.5
a—b	54.323	+1 14	.313	29	54.383	+0 9	.298	.	54.362	−0 3	.298	.
b—c	55.672	+0 22	.304	31	55.620	+0 18	.304	.	55.660	+0 6	.304	.
c—d	53.049	+0 29	.290	.	52.952	+0 29	.290	.	53.030	+0 14	.288	.
d—e	37.667	+0 38	.206	.	37.642	+0 38	.206	.	37.658	+0 21	.204	39
e—f	50.552	+0 49	.279	.	50.582	+0 49	.279	.	50.587	+0 30	.274	.
f—g	47.772	+1 0	.263	.	47.742	+0 59	.263	.	47.688	+0 38	.259	.
g—42	34.347	+1 26	0.196	29	34.340	−0 6	0.183	38.5	34.380	−0 36	0.185	37
	387.510		2.180 $=0^{r}.219$		387.499		2.122 $=0^{r}.213$		387.610		2.111 $=0^{r}.212$	

The mean results are, then,

1877, Jan. 26. True $\Delta\delta$ of ι and 42 *Orionis* $= 387^{\mathrm{r}}.729$
Jan. 27. " " " " $=$ .712
Jan. 30. " " " " $=$ .822

$387.754 \pm 0^{\mathrm{r}}.034$

The various meridian observations of the terminal stars are as follows:

42 (*c*) *Orionis.*

Authority.	Epoch.	Mean year.	δ at Epoch.	Prec. from COFFIN'S Tables.	No. of obs.	Wt.	δ 1877.0.
			° ′ ″	″			° ′ ″
BRADLEY . . .	1755	[1755]	−5 1 13.8	+ 2.936	4	½	−4 55 13.17
GOULD'S D'Agelet	1800	1784.75	4 58 49.4	2.842	1	1/16	8.81
PIAZZI . . .	1800	[1800]	58 52.0	2.842	10	½	11.63
POND	1830	[1830]	57 22.9	2.778	8	1	11.39
JOHNSON . . .	1830	[1830]	57 26.3	2.778	6	1	14.79
TAYLOR . . .	1835	[1835]	57 12.56	2.770	11	¾	15.38
Armagh . . .	1840	1853.1	56 56.25	2.755	1	¼	13.83
HENDERSON . .	1842	1843.0	56 48.6	2.755	2	1	11.49 11.89
HENDERSON . .	1843	1843.0	56 47.0	2.757	1		12.58
Greenwich . .	1864	1866.4	55 49.46	2.704	3	2	14.09
RADCLIFFE . .	1871	1871.13	−4 55 30.12	+ 2.694	1	½	−4 55 13.84

44 (ι) *Orionis.*

Authority.	Epoch.	Mean year.	δ at Epoch.	Prec. from COFFIN'S Tables.	No. of obs.	Wt.	δ 1877.0.
BRADLEY . . .	1755	[1755]	−6 5 27.8	+ 2.927	4	½	−5 59 31.93
PIAZZI . . .	1800	[1800]	3 5.6	2.832	5	½	28.31
POND	1830	[1830]	1 41.4	2.768	10	1	31.77
JOHNSON . . .	1830	[1830]	1 43.1	2.768	5	1	33.47
Σ Pos. Med. . .	1830	[1830]	1 42.0	2.768	4	2	32.37
TAYLOR . . .	1835	[1835]	1 26.59	2.758	8	½	31.17
Armagh . . .	1840	1854.1	1 12.92	2.746	1	¼	31.55
Pulkova . . .	1845	[1845]	0 59.31	2.736	?	4	32.07
Greenwich . .	1850	1851.7	0 45.40	2.726	3	2	32.05 31.94
Greenwich . .	1860	1856.1	6 0 17.66	2.704	6		31.88
RADCLIFFE . .	1868	1868.09	5 59 54.97	2.687	1	¾	30.88 32.65
RADCLIFFE . .	1870	1870.55	5 59 53.12	2.683	1		34.41
HENDERSON . .	1842	1842.7	−6 1 6.0	+ 2.742	3	.	−5 59 30.37

In these reductions I have used the proper motions $+0''.02$ for 42 and $-0''.01$ for 44 *Orionis*, adopting these and the weights on the authority of Professor T. H. **SAFFORD**. Those numbers in the column "Mean year," inclosed in brackets, are assumed, and in no case does the error of the assumption affect the final $\Delta\delta$. The differences of declination for 1877.0 are, then, as follow, using only those authorities which refer to both stars.

		°	′	″	Wt.
BRADLEY - - - - - - - - -	$\Delta\delta =$	1	4	18.8	0.25
PIAZZI - - - - - - - - -				16.7	0.25
POND - - - - - - - - - -				20.4	0.50
JOHNSON - - - - - - - - -				18.7	0.50
TAYLOR - - - - - - - - -				15.8	0.30
Armagh - - - - - - - - -				17.7	0.13
HENDERSON - - - - - - - -				18.5	0.50
Greenwich - - - - - - - -				17.9	1.00
RADCLIFFE - - - - - - - -		1	4	18.8	0.30
		1	4	18.30	

The difference of declination of these stars for 1877.0 is, then, 1° 4′ 18″.30 ± 0″.28.

The reductions to apparent place from the beginning of the year to the dates of observation, are;

1877.	42 *Orionis* (*c*).	44 *Orionis* (*ι*).	Δ
	″	″	″
Jan. 26.	+ 3.0	+ 2.8	— 0.2
27.	+ 2.9	+ 2.7	— 0.2
30	+ 2.6	+ 2.4	— 0.2

The apparent $\Delta\delta$ adopted is 1° 4′ 18″.1 ± 0″.3. The value of one revolution of Screw I is then 9″.9499 ± 0″.0002 by this method.

Observations to Determine the Value of one revolution of the Screw of Micrometer II.

The following observations were taken in a manner precisely similar to that employed for Micrometer I, and already described.

The table below gives the mean results of 239 single transits of quick-moving stars over portions of the screw between 10 and 70 revolutions.

Value of 1 *rev. of Micrometer II, from Transits.*

Date.	Observer.	Eye-piece.	Stars employed.	τ	t	m	1 rev.	Wt.	No. of single transits.	State of image.	Temp. Fahr.
1876.				h. m.	s.	r.	″				°
May 6	HOLDEN	600 A	D. M. + 0°; 3015 . .	+1 3	26.457	39.949	9.931	3	28	3	73.6*
13	HOLDEN	600 A	79 Virginis (ζ) . . .	+0 11	26.418	39.905	.927	4	45	2	58.6*
23	HOLDEN	600 A	D. M. + 0°; 3135 . .	+0 12	26.404	39.912	.920	1	25	1	61.9*
24	HOLDEN	600 A	D. M. + $\left\{\begin{matrix}3440\\3151\\3154\end{matrix}\right\}$ . .	+0 8	39.721	59.995	.927	14	52	3	65.5*
26	HOLDEN	175	α Orionis	−0 24	26.652	39.937	.924	6	46	3	77.6†
29	HOLDEN	600 A	α Leonis	+1 23	27.079	39.916	.929	7	43	4	86.7†

* Bright field. † During daylight.

From this table it follows that the value of 1 revolution of Screw II (10–70 revolutions) from 239 transits of quick-moving stars is

9″.9270 ± 0″.0004.

The precision of these observations of transits is greater than those of Screw I, and I attribute this fact to the greater ease of observing over black wires.

1876, December 20, a set of ten measures of the difference of declination of *Atlas* and *Pleione Pleiadum* was made with Micrometer II. The $\Delta\delta$ as observed was $30^{r}.238$, .297, .261, .261, .280, .250, .275, .275, .297, $30^{r}.270$; mean, $30^{r}.2708$. The true $\Delta\delta$ of the stars was $300''.21$, adopted from Professor Newcomb's discussion, and the differential refraction was $-0''.09$. From these data it follows

$$1 \text{ rev. Micrometer II} = 9''.915 \pm 0''.004.$$

It is to be noted that, as in the case of Screw I, these measures give a much smaller value of the revolution than that deduced from transits. Although the number of measures is small in the case of both Screw I and Screw II, they are remarkably accordant. In the case of Screw I there are the results of two observers. The $\Delta\delta$ of *Atlas* and *Pleione* is, according to Professor Newcomb's reduction, from

Bessel - - - - - - - - - - - -	$\Delta\delta = 300''.13$	wt. 3
Wolf - - - - - - - - - - - -	300.16	wt. 2
Meridian observations - - - - -	300.51	wt. 1

The few measures made would indicate that the last result agreed most nearly with the observations of Professor Hall and myself.

INVESTIGATION OF THE POSITION CIRCLE.

On the 8th of December, 1876, the following readings were taken by one vernier, the other being set to every 10°. Those observations marked "P." were taken by Mr. H. S. Pritchett.

Ver. I.	Ver. II.	Obs.	Ver. II.	Ver. I.	Obs.	Ver. I.	Ver. II.	Obs.
°	°		°	°		°	°	
0.00	179.99	H.	0.00	179.98	H.	0.00	179.99	P.
10.	190.02	H.	10.	190.01	H.	10.	189.99	P.
20.	200.01	H.	20.	200.01	H.	20.	199.98	P.
30.	210.01	H.	30.	210.02	H.	30.	209.99	P.
40.	220.00	H.	40.	220.01	H.	40.	219.99	P.
50.	230.00	H.	50.	230.02	H.	50.	229.99	P.
60.	240.00	H.	60.	239.99	H.	60.	239.98	P.
70.	250.01	H.	70.	250.00	H.	70.	250.00	P.
80.	260.00	H.	80.	260.00	H.	80.	259.99	P.
90.	270.01	H.	90.	270.01	H.	90.	269.99	P.
100.	280.00	H.	100.	280.02	H.	100.	280.00	P.
110.	290.01	H.	110.	290.00	H.	110.	289.99	P.
120.	300.02	H.	120.	300.02	H.	120.	299.99	P.
130.	310.00	H.	130.	310.01	H.	130.	310.00	P.
140.	320.00	H.	140.	320.00	H.	140.	320.00	P.
150.	330.02	H.	150.	330.01	H.	150.	329.99	P.
160.	340.03	H.	160.	340.01	H.	160.	340.00	P.
170.	350.02	H.	170.	350.00	H.	170.	350.00	P.
180.00	360.02	H.	180.00	360.01	H.	180.00	360.00	P.

It is plain that the readings of the Position Circle require no corrections.

Concluded Values of the Micrometer Revolution for Screws I and II.

The value of one revolution of Screw I has been found to be—

		″	″	Wt.
From 964 transits of quick-moving stars (14 nights),	1 rev. =	9.9465	± 0.0018	45
From 16 transits of 36 (H) *Cassiopeæ* (2 nights),		.9460	± 0.0002	1
From 3 measures of Δδ between 42 and 44 *Orionis* (3 nights),		.9499	± 0.0002	50
From 26 measures of Δδ between *Atlas* and *Pleione* (3 nights),		.936	± 0.002	1
From 40 measures of Δδ between *Electra* and *Merope* (5 nights),		.9409	± 0.0007	2
From measures of focal length, etc.,		.939	± 0.001	1

The weights clearly cannot be assigned by the probable errors, as this would make the 2d and 3d determinations of equal value, and I have given the weights in the last column on my best judgment.

The resulting value of 1 revolution of Screw I is 9″.94790.

The value of one revolution of Screw II has been found to be—

	″	″	Wt.
From 239 transits of quick-moving stars (6 nights),	9.9270	± 0.0004	70
From 10 measures of Δδ between *Atlas* and *Pleione* (1 night),	9.915	± 0.004	1
From measures of focal length, etc.,	9.930	± 0.001	1
From its relative length with Screw I,	9.9389	± ?	28

The resulting value of 1 revolution of Screw II is 9″.93024.

Up to this time, including the reductions of observations of the years 1873 to 1879, January 1, the value of Screw I has been assumed as 9″.9480. This differs by only 0″.0001 from the final value above, and may still be used for all distances of satellites which can be measured with this micrometer, except those of *Jupiter's* satellite IV, and of *Japetus.*

In concluding this investigation it seems proper to call attention to the excellence of these two screws in all respects, and to the credit this excellence reflects on their distinguished makers, Messrs. ALVAN CLARK & SONS.

AUXILIARY TABLE FOR COMPUTING REFRACTIONS.

Following is an auxiliary table for computing the corrections to micrometer observations on account of refraction It is entirely similar to **Bessel's** Table in *Astronomische Untersuchungen*, vol. I, page 196, and gives for each minute of the hour angle (τ) as argument, the quantities N and cot n, answering to a latitude $\varphi = +38^\circ\ 53'\ 39''$.

$$\begin{aligned} \cos n &= \cos\varphi \,.\, \sin\tau = [9.89115]\sin\tau, \\ \sin n \,.\, \sin N &= \cos\varphi \,.\, \cos\tau = [9.89115]\cos\tau, \\ \sin n \,.\, \cos N &= \sin\varphi \qquad\quad = [9.79788] \end{aligned}$$

Precepts: N is always numerically less than 90°; cos N always ***positive;***
sin N has the same sign as cos τ;
cot n has the same sign as sin τ.

$$\begin{aligned} \varDelta\delta \text{ (refraction)} &= -k' \,.\, \cot(N+\delta) \\ \varDelta\alpha \text{ (refraction)} &= -k' \,.\, \text{cosec} \,.\, (N+\delta) \,.\, \cot n \,.\, \sec\delta. \end{aligned}$$

$\varDelta\alpha$ and $\varDelta\delta$ so obtained are corrections which applied to the apparent α' and δ' will reduce them to true α and δ. The value of k' is to be taken from **Bessel's** refraction table (log α in **Chauvenet's** Astronomy, Table II). For most purposes log k' may be taken as 1.760.

Hour Angle.	*N*	log cot *n*	Hour Angle.	Hour Angle.	*N*	log cot *n*	Hour Angle.	Hour Angle.	*N*	log cot *n*	Hour Angle.
h. m.	°		h. m.	h. m.	°		h. m.	h. m.	°		h. m.
0 0	51.11	— ∞	23 60	1 0	50.13	9.3131	22 60	2 0	47.03	9.6258	21 60
[12^{h}] 1	.11	7.5310	[11^{h}] 59	[13^{h}] 1	.10	.3205	[10^{h}] 59	[14^{h}] 1	46.94	.6296	[9^{h}] 59
2	.11	.8320	58	2	.07	.3277	58	2	.88	.6335	58
3	.10	8.0081	57	3	.03	.3347	57	3	.81	.6373	57
4	.10	.1330	56	4	50.00	.3417	56	4	.74	.6410	56
0 5	.10	.2300	23 55	1 5	49.96	.3486	22 55	2 5	.66	.6448	21 55
6	.10	.3092	54	6	.92	.3554	54	6	.59	.6485	54
7	.09	.3751	53	7	.89	.3621	53	7	.51	.6522	53
8	.09	.4341	52	8	.85	.3686	52	8	.43	.6559	52
9	.08	.4853	51	9	.81	.3751	51	9	.35	.6595	51
0 10	51.08	8.5311	23 50	1 10	49.77	9.3815	22 50	2 10	46.27	9.6631	21 50
11	.07	.5725	49	11	.73	.3878	49	11	.19	.6667	49
12	.07	.6103	48	12	.69	.3941	48	12	.11	.6703	48
13	.06	.6451	47	13	.65	.4002	47	13	46.03	.6738	47
14	.05	.6773	46	14	.61	.4063	46	14	45.95	.6773	46
0 15	.05	.7073	23 45	1 15	.57	.4123	22 45	2 15	.87	.6808	21 45
16	.04	.7354	44	16	.53	.4182	44	16	.78	.6843	44
17	.03	.7617	43	17	.49	.4241	43	17	.70	.6878	43
18	.02	.7866	42	18	.44	.4298	42	18	.61	.6912	42
19	.01	.8101	41	19	.40	.4355	41	19	.53	.6946	41
0 20	51.00	8.8324	23 40	1 20	49.35	9.4412	22 40	2 20	45.44	9.6980	21 40
21	50.99	.8537	39	21	.31	.4467	39	21	.35	.7014	39
22	.98	.8739	38	22	.26	.4522	38	22	.26	.7047	38
23	.96	.8933	37	23	.22	.4577	37	23	.17	.7081	37
24	.95	.9118	36	24	.17	.4631	36	24	45.08	.7114	36
0 25	.94	.9296	23 35	1 25	.12	.4684	22 35	2 25	44.99	.7146	21 35
26	.93	.9467	34	26	.07	.4737	34	26	.90	.7179	34
27	.91	.9632	33	27	49.02	.4789	33	27	.80	.7212	33
28	.90	.9790	32	28	48.97	.4840	32	28	.71	.7244	32
29	.88	8.9943	31	29	.92	.4891	31	29	.62	.7276	31
0 30	50.87	9.0091	23 30	1 30	48.87	9.4942	22 30	2 30	44.52	9.7308	21 30
31	.85	.0234	29	31	.82	.4992	29	31	.43	.7340	29
32	.83	.0373	28	32	.77	.5041	28	32	.33	.7371	28
33	.82	.0507	27	33	.72	.5090	27	33	.23	.7403	27
34	.80	.0638	26	34	.66	.5138	26	34	.13	.7434	26
0 35	.78	.0764	23 25	1 35	.61	.5186	22 25	2 35	44.03	.7465	21 25
36	.76	.0887	24	36	.55	.5234	24	36	43.93	.7496	24
37	.74	.1007	23	37	.50	.5281	23	37	.83	.7527	23
38	.72	.1124	22	38	.44	.5328	22	38	.73	.7557	22
39	.70	.1237	21	39	.38	.5374	21	39	.62	.7588	21
0 40	50.68	9.1348	23 20	1 40	48.33	9.5420	22 20	2 40	43.52	9.7618	21 20
41	.65	.1457	19	41	.27	.5465	19	41	.41	.7648	19
42	.63	.1562	18	42	.21	.5510	18	42	.31	.7678	18
43	.61	.1665	17	43	.15	.5555	17	43	.20	.7707	17
44	.59	.1766	16	44	.09	.5599	16	44	43.09	.7737	16
0 45	.56	.1865	23 15	1 45	48.03	.5642	22 15	2 45	42.98	.7766	21 15
46	.54	.1961	14	46	47.97	.5686	14	46	.87	.7796	14
47	.51	.2055	13	47	.90	.5729	13	47	.76	.7824	13
48	.49	.2148	12	48	.84	.5772	12	48	.65	.7854	12
49	.46	.2239	11	49	.78	.5814	11	49	.54	.7882	11
0 50	50.43	9.2328	23 10	1 50	47.71	9.5856	22 10	2 50	42.42	9.7911	21 10
51	.41	.2415	9	51	.65	.5898	9	51	.31	.7940	9
52	.38	.2500	8	52	.58	.5939	8	52	.19	.7968	8
53	.35	.2584	7	53	.52	.5980	7	53	42.08	.7996	7
54	.32	.2666	6	54	.45	.6020	6	54	41.96	.8024	6
0 55	.29	.2747	23 5	1 55	.38	.6061	22 5	2 55	.84	.8052	21 5
56	.26	.2827	4	56	.31	.6101	4	56	.72	.8080	4
57	.23	.2905	3	57	.24	.6140	3	57	.60	.8108	3
58	.20	.2982	2	58	.17	.6180	2	58	.48	.8135	2
[12^{h}] 9	.17	.3057	[11^{h}] 1	[13^{h}] 59	.10	.6219	[10^{h}] 1	[14^{h}] 59	.36	.8163	[9^{h}] 1
0 60	50.13	9.3131	23 0	1 60	47.03	9.6258	22 0	2 60	41.24	9.8190	21 0

Sin *N* has the same sign as cos τ; cot *n* has the same sign as sin τ.

Hour Angle.	*N*	log cot *n*	Hour Angle.	Hour Angle.	*N*	log cot *n*	Hour Angle.	Hour Angle.	*N*	log cot *n*	Hour Angle.
h. m.	°		h. m.	h. m.	°		h. m.	h. m.	°		h. m.
3 0	41.23	9.8190	20 60	4 0	31.79	9.9602	19 60	5 0	17.79	0.0569	18 60
[15^h] 1	.11	.8217	[8] 59	[16] 1	.60	.9622	[7] 59	[17^h] 1	.52	.0581	[6] 59
2	40.98	.8244	58	2	.40	.9642	58	2	17.24	.0593	58
3	.86	.8271	57	3	.20	.9662	57	3	16.97	.0604	57
4	.73	.8298	56	4	31.00	.9681	56	4	.69	.0615	56
3 5	.60	.8324	20 55	4 5	30.80	.9701	19 55	5 5	.42	.0626	18 55
6	.47	.8351	54	6	.60	.9720	54	6	16.14	.0636	54
7	.34	.8377	53	7	.40	.9740	53	7	15.86	.0647	53
8	.21	.8403	52	8	30.20	.9759	52	8	.58	.0657	52
9	40.08	.8429	51	9	29.99	.9778	51	9	.30	.0668	51
3 10	39.94	9.8455	20 50	4 10	29.79	9.9797	19 50	5 10	15.02	0.0678	18 50
11	.81	.8481	49	11	.58	.9815	49	11	14.74	.0687	49
12	.67	.8507	48	12	.37	.9834	48	12	.45	.0697	48
13	.54	.8532	47	13	29.16	.9853	47	13	14.17	.0707	47
14	.40	.8558	46	14	28.95	.9871	46	14	13.88	.0716	46
3 15	.26	.8583	20 45	4 15	.73	.9889	19 45	5 15	.59	.0725	18 45
16	39.12	.8608	44	16	.52	.9908	44	16	.31	.0734	44
17	38.98	.8633	43	17	.30	.9926	43	17	13.02	.0743	43
18	.84	.8658	42	18	28.09	.9944	42	18	12.73	.0751	42
19	.69	.8683	41	19	27.87	.9961	41	19	.44	.0760	41
3 20	38.55	9.8708	20 40	4 20	27.65	9.9979	19 40	5 20	12.15	0.0768	18 40
21	.40	.8733	39	21	.43	9.9996	39	21	11.86	.0776	39
22	.25	.8757	38	22	27.21	0.0014	38	22	.56	.0784	38
23	38.11	.8781	37	23	26.98	.0031	37	23	11.27	.0791	37
24	37.96	.8806	36	24	.76	.0048	36	24	10.97	.0799	36
3 25	.81	.8830	20 35	4 25	.53	.0065	19 35	5 25	10.68	.0806	18 35
26	.66	.8854	34	26	.30	.0082	34	26	.38	.0813	34
27	.50	.8878	33	27	26.07	.0099	33	27	10.09	.0820	33
28	.35	.8901	32	28	25.84	.0115	32	28	9.79	.0827	32
29	.19	.8925	31	29	.61	.0132	31	29	9.49	.0833	31
3 30	37.04	9.8949	20 30	4 30	25.38	0.0148	19 30	5 30	9.19	0.0839	18 30
31	36.88	.8972	29	31	25.14	.0164	29	31	8.89	.0845	29
32	.72	.8996	28	32	24.91	.0180	28	32	.59	.0851	28
33	.56	.9019	27	33	.67	.0196	27	33	8.29	.0857	27
34	.40	.9042	26	34	.43	.0212	26	34	7.99	.0862	26
3 35	.24	.9065	20 25	4 35	24.19	.0228	19 25	5 35	.68	.0868	18 25
36	36.08	.9088	24	36	23.95	.0233	24	36	.38	.0873	24
37	35.91	.9110	23	37	.71	.0259	23	37	7.08	.0878	23
38	.75	.9133	22	38	.47	.0274	22	38	6.78	.0882	22
39	.58	.9156	21	39	23.22	.0289	21	39	.47	.0887	21
3 40	35.41	9.9178	20 20	4 40	22.97	0.0304	19 20	5 40	6.17	0.0891	18 20
41	.24	.9200	19	41	.73	.0318	19	41	5.86	.0895	19
42	35.07	.9222	18	42	.48	.0333	18	42	.55	.0899	18
43	34.90	.9245	17	43	22.23	.0347	17	43	5.25	.0902	17
44	.72	.9267	16	44	21.98	.0362	16	44	4.94	.0906	16
3 45	.55	.9288	20 15	4 45	.72	.0376	19 15	5 45	.63	.0909	18 15
46	.38	.9310	14	46	.47	.0390	14	46	4.33	.0912	14
47	.20	.9332	13	47	21.22	.0404	13	47	4.02	.0915	13
48	34.02	.9353	12	48	20.96	.0418	12	48	3.71	.0918	12
49	33.85	.9375	11	49	.70	.0431	11	49	.40	.0920	11
3 50	33.66	9.9396	20 10	4 50	20.44	0.0445	19 10	5 50	3.09	0.0922	15 10
51	.48	.9417	9	51	20.18	.0458	9	51	2.79	.0924	9
52	.30	.9438	8	52	19.92	.0471	8	52	.48	.0926	8
53	33.11	.9459	7	53	.66	.0484	7	53	2.17	.0928	7
54	32.93	.9480	6	54	.40	.0496	6	54	1.86	.0929	6
3 55	.74	.9500	20 5	4 55	19.13	.0509	19 5	5 55	.55	.0930	18 5
56	.56	.9521	4	56	18.86	.0521	4	56	1.24	.0931	4
57	.37	.9541	3	57	.60	.0534	3	57	0.93	.0932	3
58	32.18	.9562	2	58	.33	.0546	2	58	0.62	.0932	2
[15^h] 59	31.98	.9582	[8^h] 1	[16^h] 59	18.06	.0558	[7^h] 1	[17^h] 59	0.31	.0933	[6^h] 1
3 60	31.79	9.9602	20 0	4 60	17.79	0.0569	19 0	5 60	0.00	0.0933	18 0

Sin *N* has the same sign as cos τ; cot *n* has the same sign as sin τ.

APPENDIX II.

THE MULTIPLE STAR Σ 748.

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ON THE MULTIPLE STAR Σ 748 IN NEBULA ORIONIS.

$[\alpha = 5^{\mathrm{h}}\ 29^{\mathrm{m}}\ 8^{\mathrm{s}}.163;\ \delta = -5^{\circ}\ 28'\ 26''.31;\ 1875.0]$,

BY

EDWARD S. HOLDEN,

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The stars of this system are visible to the naked eye as one star of the 4th magnitude (ARGELANDER), and they were known to the ancients as one star. Their critical situation just at the brightest part of the most remarkable nebula visible in northern latitudes makes the question of their physical association an important one, and accordingly they have received more attention than any other group. It may not be out of place to summarize the history of this multiple star since its discovery to the present time.

It was first formally pointed out by Professor R. WOLF, of Zurich, that HUYGHENS was not, as commonly supposed, the discoverer of the Nebula of Orion,[*] and that this distinction must be awarded to CYSAT, who saw it in 1618, 38 years before HUYGHENS published his account of it. CYSAT'S mention of his discovery is on p. 75 of his *Mathemeta Astronomica de Cometi Anni* 1618, and was incidentally mentioned by BESSEL in the *Berliner Jahrbuch* for 1808, p. 122. CYSAT does not speak definitely of the number of stars, although he clearly indicates their locality.

HUYGHENS describes in the *Systema Saturnium*, 1659, p. 8, his discovery of its Nebula of Orion, and speaks of "three stars close together," of which he gives a figure.

This was what is now known as the trapezium of *Orion*. HUYGHENS was probably using his telescope of 23 feet, with an aperture of $2^{\mathrm{in}}.33$ (63^{mm}) and a magnifying power of 48,50 or 92 diameters.[†] With this instrumental means he should have seen the fourth star of the trapezium, as indeed he did for the first time on January 8, 1684. The very last astronomical observation made by HUYGHENS (1694, February 4) was upon this system, and the sketch in his manuscript journal under that date gives the four stars.[‡]

It appears that HUYGHENS' first observation did not escape HOOKE, for we find the following note in his *Micrographia*, p. 242 (folio, London, 1665):[§]

"In that notable Asterism also of the sword of Orion, where the ingenious

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[*] *Astronomische Nachrichten*, vol. xxxvii, col. 109, and "J. B. CYSAT VON LUZERN," 4°, Bern, 1853.

[†] See ARAGO, *Annuaire du Bureau des Longitudes*, 1842, p. 268.

[‡] See KAISER, in *Tidschrift voor de Wis-en Naturkundige Wetenschappen*, vol. i, 1848, p. 7.

[§] For this reference I am indebted to the courtesy of H. B. WHEATLEY, esq., Assistant Librarian of the Royal Society of London, to whom all matters pertaining to the works of HOOKE are familiar.

Monsieur **Hugens Van Zulichem** has discovered only three little stars in a cluster, I have, with a thirty-six foot glass, without any aperture [diaphragm] (the breadth of the glass being some three inches and a half), discovered five, and the twinkling of divers others up and down in divers parts of that small milky cloud." According to **Arago** (*op. cit.*, p. 269), **Hooke's** 12-foot telescope magnified 74 diameters, and it is probable that even a higher power was used with his thirty-six foot glass. The eye-piece of the 12-foot, if used on the 36-foot, would have given a power of over 200 diameters.

It would seem, from the words taken literally, that **Hooke** was really the discoverer of the fourth and fifth stars of the trapezium, and on comparing **Huyghens'** drawing with **Hooke's** description this supposition appears to be strengthened. **Hooke** could only have referred to this drawing of **Huyghens**, as nothing else had been published, and nowhere else in this figure are "three little stars in a cluster" except those belonging to the trapezium.

Sir **John Herschel** has also found in the original MS. Journal of the Royal Society of London, the following extract, which was pointed out to him by Sir **James South**:

> September 7, 1664. Mr. **Hooke**: * * * "The same relateth to have found those stars in *Orion's* belt, which M. **de Zulichem** maketh but three to be five."

Sir **John** remarks upon this, "As I have not been able to learn what is the observation of M. **de Zulichem** referred to, it is impossible to say whether this refers to the trapezium in the nebula or rather to some group in the belt properly so called. In **Huyghens'** figure of the nebula it is singular, however, that three stars only are marked in the trapezium."*

In the light of the extract from the *Micrographia*, it would seem that the nebula proper—"that small milky cloud"—was referred to by **Hooke**, and the telescope used by **Hooke** was certainly capable of showing the fourth star of the trapezium, and possibly also the fifth star. These two stars were independently discovered by **Cassini**† and W. **Struve**, respectively.‡

Special experiments on this point were made by me in 1878, January 3, 5, 6, with the 26-inch equatorial, with its aperture reduced to 3.50 inches. The focal length of this telescope is about 32 feet, and the lowest magnifying power (175) was employed. The central 3.5 inches of the **Clark** objective are certainly far more perfect than **Hooke's** whole objective could be. On these three nights the four stars of the trapezium were seen with others (see Washington Observations for 1878 for details), but I was certain that if the 5th and 6th stars were, in 1664, of their present brightness they would not have been discovered by **Hooke**. At the same time some of the following references (many of which I owe to the kindness of S. W. **Burnham**, Esq.) would indicate that an aperture of 3½ inches could show the 5th star under favorable circumstances.

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* *Memoirs* R. A. S., iii, p. 188.

† **Cassini**: *de Cometâ anni*, 1652–3.

‡ **Struve**: *Catalogus Novus Stellarum Duplicium et Multiplicium*, p. xiv, and **Herschel**, *Mem.* R. A. S., iii, p. 187.

The 6th star of the trapezium has been seen by Captain Noble, F. R. A. S., with an aperture of 4.2 inches, and the 5th was always seen by him with that aperture.[*]

David Gill, Esq., with a Ross equatorial 3⅜ inches aperture, records an observation of the trapezium in which both the 5th and 6th stars must have been seen, although this is not expressly stated.[†]

R. J. Ryle, in January, 1872, saw the 6th star with 3 inches.[‡]

T. H. Buffham could not see the 5th star with less than 4 inches aperture.[§]

Rev. W. R. Dawes saw the 5th star *once* and only once with his 3.8 inch.[‖]

H. Sadler saw the 5th star with a 3-inch glass in December, 1871.[¶]

Herr Temple reports seeing both 5th and 6th stars with 4 [French?] inches aperture.[**]

The sixth star was discovered by Sir John Herschel December 25, 1832.[††]

Other stars within or around the trapezium have been reported by various observers with telescopes of all classes from the largest down to those of about 3 inches aperture. In regard to all these supposed stars I can only say that, after a careful examination of all the evidence presented, and after a six-years' series of observations of the nebula immediately surrounding the trapezium, I have not seen nor suspected any such.

MICROMETRIC OBSERVATIONS OF Σ 748.

We possess a large number of measures of the several pairs of this system, and in particular careful discussions of series of observations by W. Struve, Liaponoff, and Nobile. The conclusion arrived at by these observers is that it is likely that the four principal stars are physically connected, as the comparison of their several measures showed progressive changes in some of the co-ordinates. The recent observations made by Professor Hall with the 26-inch equatorial present important evidence on this point, and I have, by Professor Hall's permission, collected and discussed these in what follows:

WASHINGTON OBSERVATIONS OF Σ 748.

In 1877 Professor Hall made a long series of measures of the six stars of the system Σ 748, using the 26-inch telescope and micrometer I. Each night's work for each pair of stars consisted in the measure of four angles of position, the circle being read to 0°.1, and the parallel being determined frequently throughout the series. The distance of any pair was determined on any night by four measures of *double* distance, in the manner described in *Washington Astronomical Observations*, 1874, Appendix I, p. 35. This series was made throughout with the same eye-piece, an achromatic, made by Kahler, of Washington, magnifying about 400 diameters, and having a field of view of 6′ 14″. The wires were illuminated by a red lamp held by an assistant, and were very fine and sharp.

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[*] Monthly Notices, R. A. S., vol. 26, p. 73.

[†] Monthly Notices, R. A. S., vol. 27, p. 316.

[‡] Astronomical Register, August, 1872.

[§] Astronomical Register, September, 1872.

[‖] English Mechanic, March 27, 1874.

[¶] English Mechanic, April 17, 1874.

[**] Astronomische Nachrichten, No. 1898.

[††] See *Astronomical Observations at the Cape of Good Hope*.

A similar series was made in 1878 by Professor HALL with the same telescope and eye-piece, and in the same manner, the only change being that the field was illuminated and black wires used, and that the position circle was read to 0°.01. In both series each night's work on any pair consists, then, of 4 measures of the position angle, of 4 measures of the double distance, these measures being throughout made by the same observer by the same instrumental means. The two series are exactly similar except in the illumination of the wires.

This work will throw light upon three points:

1. Is the system Σ 748 a physical system, as it is suspected to be by W. STRUVE,[*] LIAPONOFF,[†] and NOBILE?[‡]

2. What is the relative weight of double-star observations of this observer by the two methods?

3. In the case of this observer, with what degree of consistency are the angles and diagonals of a quadrilateral measured?

The discussion of this work is also of immediate interest to myself in its bearing upon a long series of observations upon the *regio Huygheniana* of the nebula of *Orion*.

In what follows, I have brought together the results of observations of each pair of stars. For the observations in detail reference is made to the Observatory volumes for 1877 and 1878. The values $P, P'; \ldots\ldots\ P^{v}$; $d, d' \ldots\ d^{v}$ are final values of the position angles and distances of each pair corrected for erroneous position of the instrument and for differential refraction.

NOMENCLATURE OF THE STARS OF THE TRAPEZIUM.

The nomenclature of LIAPONOFF seems to be the most convenient, and will be used throughout. I give below a table showing the synonyms:

Star. BOND'S number.	Star. LIAPONOFF'S letter.	Star. HERSCHEL'S letter.	Star. STRUVE'S letter.	Star. HALL'S letter.[§]	1857.0. $\Delta\alpha$	1857.0. $\Delta\delta$
617	*b'*	*a'*	E	*b*	$-10''.7$	$+12''.9$
619	*b*	β	A	B	-10.0	$+8.7$
624	*d*	δ	B	C	-5.0	$+16.1$
628[‖]	*a*	*a*	C	A	0.0	0.0
633[¶]	[*a'*.]	γ'	(F)	*a*	$+3.5$	-2.1
640[**]	*c*	γ	II	II	$+11.5$	$+6.8$

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[*] See *Mensuræ Micrometricæ*, p. 242.

[†] See *Observations de la Grande Nebuleuse d'Orion*, p. 45.

[‡] See *Osservazione del Sistema*, 748 Σ, p. 13.

[§] Used in the *Washington Astronomical Observations*, 1877 and 1878.

[‖] "Fifth star."

[¶] θ' *Orionis*, FLAMSTEED.

[**] "Sixth star."

*Washington Observations of the Four Principal Stars.**

a and *b*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Jan. 30	− 2 12	311.1	13.14	Feb. 5	− 1 17	310.95	13.23
Feb. 1	− 1 48	310.6	12.98	6	− 0 53	310.03	13.31
6	− 1 30	311.2	13.15	20	− 0 47	311.03	13.10
8	− 1 30	310.4	13.21	27	− 0 23	311.27	13.06
9	− 1 6	310.8	13.11	28	− 0 29	311.23	13.23
10	− 0 54	311.1	13.23	Mar. 1	− 0 23	310.47	13.19
				5	− 0 17	310.20	13.17
$P = 311^\circ.00 \pm 0^\circ.09$ $d = 13''.124 \pm 0''.025$				$P = 310^\circ.74 \pm 0^\circ.13$ $d = 13''.186 \pm 0''.022$			

a and *c*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Jan. 30	− 1 42	60.4	13.53	Feb. 6	− 0 5	61.87	13.34
Feb. 1	− 1 0	61.3	13.49	20	− 0 13	61.73	13.48
6	− 1 0	61.4	13.42	27	+ 0 5	61.33	13.38
8	− 1 30	61.2	13.72	28	− 0 3	61.27	13.55
9	− 1 6	60.8	13.53	Mar. 1	+ 0 5	61.13	13.41
10	− 0 54	61.7	13.37	5	+ 0 19	61.65	13.41
				8	+ 0 34	61.65	13.29
$P' = 61^\circ.11 \pm 0^\circ.13$ $d' = 13''.503 \pm 0''.033$				$P'\ 61^\circ.52 \pm 0^\circ.07$ $d' = 13''.409 \pm 0''.022$			

a and *d*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Jan. 30	− 1 54	342.1	16.97	Feb. 6	− 0 29	342.15	16.65
Feb. 1	− 1 24	342.5	16.78	20	− 0 30	342.73	16.83
6	− 1 18	342.2	16.79	27	− 0 9	343.37	16.77
8	− 1 12	342.5	16.92	28	− 0 16	342.70	16.87
9	− 0 54	342.5	16.83	Mar. 1	− 0 9	342.05	16.80
10	− 0 42	343.0	16.72	5	+ 0 1	342.33	16.73
28	− 0 24	342.6	16.80	8	+ 0 13	342.50	16.71
Mar. 15	+ 1 30	342.4	16.86				
$P'' = 342^\circ.49 \pm 0^\circ.07$ $d'' = 16''.846 \pm 0''.019$				$P'' = 342^\circ.57 \pm 0^\circ.08$ $d'' = 16''.777 \pm 0''.016$			

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* In these tables *P* and *d* are not the means of the separate observations here set down, but are derived from them as explained on page 11.

Washington Observations of the Four Principal Stars.

b and *c*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Feb. 15	− 0 30	95.5	21.62	Feb. 20	+ 0 21	94.95	21.49
28	+ 0 18	95.4	21.49	27	+ 0 33	95.65	21.67
Mar. 3	+ 0 36	95.7	21.76	28	+ 0 23	95.75	21.76
10	+ 1 36	95.4	21.74	Mar. 1	+ 0 34	95.47	21.78
15	+ 0 36	95.5	21.67	5	+ 0 55	95.75	21.67
20	+ 2 0	95.5	21.72	8	+ 0 55	95.70	21.57
				20	+ 1 25	95.95	21.72

1877: $P''' = 95^\circ.50 \pm 0^\circ.03$, $d''' = 21''.672 \pm 0''.028$

1878: $P''' = 95^\circ.60 \pm 0^\circ.08$, $d''' = 21''.666 \pm 0''.027$

b and *d*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Feb. 11	− 1 6	214.7	8.76	Feb. 20	+ 0 4	213.30	8.78
14	− 1 30	213.1	8.70	27	+ 0 19	214.13	8.92
15	− 1 24	214.5	8.78	28	+ 0 10	213.17	8.80
28	− 0 12	212.1	8.77	Mar. 1	+ 0 19	213.87	8.79
Mar. 3	− 0 18	212.3	8.84	5	+ 0 37	213.27	8.75
10	+ 1 0	213.3	8.77	20	+ 1 1	213.50	8.80
15	+ 1 12	212.8	8.56				
20	+ 1 30	213.1	8.66				

1877: $P^{\mathrm{iv}} = 213^\circ.22 \pm 0^\circ.23$, $d^{\mathrm{iv}} = 8''.730 \pm 0''.021$

1878: $P^{\mathrm{iv}} = 213^\circ.54 \pm 0^\circ.12$, $d^{\mathrm{iv}} = 8''.807 \pm 0''.016$

c and *d*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Feb. 11	− 0 18	118.8	19.40	Feb. 20	+ 0 37	119.03	19.37
15	− 1 6	119.1	19.54	27	+ 0 47	118.65	19.38
28	0 0	119.3	19.54	28	+ 0 37	119.67	19.36
Mar. 3	+ 0 12	119.3	19.46	Mar. 1	+ 0 49	119.10	19.33
10	+ 1 18	119.1	19.46	5	+ 1 13	119.65	19.40
15	+ 0 54	119.4	19.41	20	+ 1 49	119.05	19.48
20	+ 1 48	119.3	19.41				

1877: P $119^\circ.21 \pm 0^\circ.06$, $d^{\mathrm{v}} = 19''.457 \pm 0''.015$

1878: P $119^\circ.14 \pm 0^\circ.11$, $d^{\mathrm{v}} = 19''.391 \pm 0''.014$

POSITION OF THE INSTRUMENT DURING THE OBSERVATIONS AND ITS EFFECT ON OBSERVED POSITION ANGLES.

The position of the pole of the equatorial was determined as below:

1876. Dec. 13, $\eta = +0'.28$; $\xi = -1'.60$
1877. Jan. 9, $\eta = +0'.27$; $\xi = -1'.61$
1878. Jan. 3, $\eta = +0'.47$; $\xi = +1'.34$

The effect of an erroneous position of the pole of the instrument upon an observed distance (s) is zero; upon an observed position angle (p) it is

$$dp = e \sin (A - t) \sec \delta \, *$$

where $e = \frac{\eta}{\sin A}$, $\tan A = \frac{\eta}{\xi}$. t and δ are the hour angle and declination of the star, and dp is the correction to the observed p. In this series t was never so great as 45°; A was about 170°, and λ was 1'.6, whence dp is about 0°.02 or 1'.2, a quantity which may be neglected.

CORRECTION OF THE OBSERVATIONS FOR DIFFERENTIAL REFRACTION.

The observations were corrected for differential refraction in the following way: From each p and s observed, y and x ($\Delta\alpha$ and $\Delta\delta$) were computed by the formulæ

$$y = s \sin p; \quad x = s \cos p.$$

From the following table the corrections for refraction ($\Delta\alpha$) and ($\Delta\delta$) were taken, and the mean y and x thus computed were used to compute the concluded P and d, which are written below the separate results on pp. 9–10.

The table gives the values of ($\Delta\alpha$) and ($\Delta\delta$) for any pair of stars for which $x^1 - x^2 = 10''$. For other values of $x^1 - x^2$ proportional parts of the tabular ($\Delta\alpha$) and ($\Delta\delta$) must be taken. The argument is the hour angle t.

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* STRUVE, *Mensuræ Micrometricæ*, p. 19.

Table for Differential Refraction in Nebula of Orion.

Hour Angle t	Refraction $(\Delta\alpha)$ for $\delta - \delta' = 10''$	Refraction $(\Delta\delta)$ for $\delta - \delta' = 10''$	Hour Angle t	Refraction $(\Delta\alpha)$ for $\delta - \delta' = 10''$	Refraction $(\Delta\delta)$ for $\delta - \delta' = 10''$
h. m.	″	″	h. m.	″	″
0 0	0.000	0.005	1 35	0.002	0.006
5	.000	.005	40	.002	.006
10	.000	.005	45	.002	.006
15	.000	.005	50	.002	.006
20	.000	.005	1 55	0.002	0.006
25	.000	0.006			
30	0.001	.006	2 0	0.002	0.006
35	.001	.006	5	.002	.006
40	.001	.006	10	.002	.007
45	.001	.006	15	.003	.007
50	.001	.006	20	.003	.007
0 55	0.001	0.006	25	.003	.007
1 0	0.001	0.006	30	0.003	0.007
5	.001	.006	35	.003	.007
10	.001	.006	40	.004	.007
15	.001	.006	45	·004	.008
20	.001	.006	50	.004	.008
25	.001	.006	2 55	0.004	0.008
1 30	0.002	0.006	3 0	0.005	0.008

For a star *east* of a; $\Delta\alpha$ is +.
" " *west* of a; $\Delta\alpha$ is —.
" " *north* of a; $\Delta\delta$ and $(\Delta\delta)$ are +; for *west* hour angles $(\Delta\alpha)$ is +.
" " *south* of a; $\Delta\delta$ and $(\Delta\delta)$ are —; for *west* hour angles $(\Delta\alpha)$ is —.

Collecting the values of P, P' . . .; d, d' . . . . for both series, we have as the data from which to conclude the most probable values:

Pair,	*a* and *b*	*a* and *c*	*a* and *d*	*b* and *c*	*b* and *d*	*c* and *d*
Dark field, 1877,	$P=311^\circ.00$	$P'=61^\circ.11$	$P''=342^\circ.49$	$P'''=95^\circ.50$	$P^{\text{iv}}=33^\circ.22$	$P^{\text{v}}=299^\circ.21$
Bright field, 1878,	$P=310^\circ.74$	$P'=61^\circ.52$	$P''=342^\circ.57$	$P'''=95^\circ.60$	$P^{\text{iv}}=33^\circ.54$	$P^{\text{v}}=299^\circ.14$
Dark field, 1877,	$d=13''.124$	$d'=13''.503$	$d''=16''.846$	$d'''=21''.672$	$d^{\text{iv}}=8''.730$	$d^{\text{v}}=19''.457$
Bright field, 1878,	$d=13''.186$	$d'=13''.409$	$d''=16''.777$	$d'''=21''.666$	$d^{\text{iv}}=8''.807$	$d^{\text{v}}=19''.391$
No. of nights, 1877,	6	6	8	6	8	7
No. of nights, 1878,	7	7	7	7	6	6
Total No. of nights, 1877–'8,	13	13	15	13	14	13

The methods of **Struve** and the nomenclature of **Liaponoff** (*op. cit.*, p. 41) have been followed, and

$$\text{For 1877 I find,}\ \begin{cases} \alpha = +8''.603 & \alpha' = +\ 6''.523 & \alpha'' = +16''.065 \\ \beta = -9''.898 & \beta' = +11''.823 & \beta'' = -\ 5''.070 \end{cases}$$

$$\text{For 1878}\ \ldots\ \begin{cases} \alpha = +8''.606 & \alpha' = +\ 6''.394 & \alpha'' = +16''.006 \\ \beta = -9''.990 & \beta' = +11''.786 & \beta'' = -\ 5''.026 \end{cases}$$

$$\text{For 1877,}\ \begin{cases} Q''' = 95^\circ.47 & e''' = 21''.820 & \pi''' = +0^\circ.03 & \varepsilon''' = +0''.148 \\ Q^{\text{iv}} = 32^\circ.94 & e^{\text{iv}} = 8''.879 & \pi^{\text{iv}} = +0^\circ\ 28 & \varepsilon^{\text{iv}} = +0''.149 \\ Q^{\text{v}} = 299^\circ.46 & e^{\text{v}} = 19''.402 & \pi^{\text{v}} = -0^\circ.25 & \varepsilon^{\text{v}} = -0''.055 \end{cases}$$

$$\text{For 1878,}\ \begin{cases} Q''' = 95^\circ.80 & e''' = 21''.887 & \pi''' = -0^\circ.20 & \varepsilon''' = +0''.221 \\ Q^{\text{iv}} = 33^\circ.85 & e^{\text{iv}} = 8''.991 & \pi^{\text{iv}} = -0^\circ.31 & \varepsilon^{\text{iv}} = +0''.184 \\ Q^{\text{v}} = 299^\circ.76 & e^{\text{v}} = 19''.365 & \pi^{\text{iv}} = -0^\circ.62 & \varepsilon^{\text{v}} = -0''.026 \end{cases}$$

It is to be remarked that Q''', Q^{iv}, Q^{v}, and e''', e^{iv}, e^{v} are the values of P''', P^{iv}, P^{v}, and d''', d^{iv}, d^{v} *computed* from the observed P, P', P'', and d, d', d''. The residuals (O—C.)

$$\pi''' = P''' - Q''',\ \pi^{\text{iv}} = P^{\text{iv}} - Q^{\text{iv}},\ \pi^{\text{v}} = P^{\text{v}} - Q^{\text{v}}$$

and

$$-\varepsilon''' = d''' - e''',\ -\varepsilon^{\text{iv}} = d^{\text{iv}},\ e^{\text{iv}},\ -\varepsilon^{\text{v}} = d^{\text{v}} - e^{\text{v}}$$

show at once with what degree of consistency the angles and distances of this quadrilateral were measured in the two years. It appears that the 1877 series was slightly more consistent as a whole, although as will be seen the 1878 measures have the smallest probable error.

Before forming the 12 equations of condition for determining the 6 unknown quantities which give the $\Delta\alpha$ and $\Delta\delta$ of the three stars b, c, and d with respect to a, it is necessary to determine the relative weights of the mean results of the observations of distance and of position angle for each pair of stars. The data for this purpose are given below.

The probable errors of the mean results for the various pairs is as follows:

	1877.		Nights.	1878.		Nights.	Total No. of nights.
	$\Delta P''$	$\Delta d''$		$\Delta P''$	$\Delta d''$		
	$''$	$''$		$''$	$''$		
a and *b* .	0.020	0.025	6	0.030	0.022	7	13
a and *c* .	.030	.033	6	.016	.022	7	13
a and *d* .	.019	.019	8	.023	.016	7	15
b and *c* .	.011	.028	6	.031	.027	7	13
b and *d* .	.035	.021	8	.018	.016	6	14
c and *d* .	0.019	0.015	7	0.037	0.014	6	13
Mean .	0''.022	0''.023		0''.026	0''.020		

The probable error of a single night for each pair is:

	1877.		1878.	
	$\Delta P''$	$\Delta d'$	$\Delta P''$	$\Delta d'$
	°	″	°	″
a and *b* .	0.22	0.060	0.34	0.057
a and *c* .	.31	.081	.17	.058
a and *d* .	.18	.055	.20	.041
b and *c* .	.07	.068	.22	.070
b and *d* .	.66	.059	.29	.040
c and *d* .	0.15	0.036	0.27	0.035
Mean .	0°.27	0″.060	0°.25	0″.050

The conclusions to be drawn from these tables are

(*a*) The weight of 4 observations of P is practically the same as the weight of 4 observations of the *double* distance, and this whether bright or dark field is used.

(*b*) The weight of a number of observations of either p or s with a bright field is slightly greater than the weight of the same number of observations with a dark field.

FORMATION OF EQUATIONS OF CONDITIONS.

The coefficients of the equations of condition resulting from the geometrical relations of the lines and angles measured are

	a	*b*	*c*	*d*	*e*	*f*	*n*
1.	$+\cos P$	0	0	$+\sin P$	0	0	0
2.	0	$+\cos P'$	0	0	$+\sin P'$	0	0
3.	0	0	$+\cos P''$	0	0	$+\sin P''$	0
4.	$+\sin P$	0	0	$-\cos P$	0	0	0
5.	0	$+\sin P'$	0	0	$-\cos P'$	0	0
6.	0	0	$+\sin P''$	0	0	$-\cos P''$	0
7.	$-\cos P'''$	$+\cos P'''$	0	$-\sin P'''$	$+\sin P'''$	0	$+\varepsilon'''$
8.	$-\cos P^{iv}$	0	$+\cos P^{iv}$	$-\sin P^{iv}$	0	$+\sin P^{iv}$	$+\varepsilon^{iv}$
9.	0	$-\cos P^{v}$	$-\cos P^{v}$	0	$-\sin P^{v}$	$+\sin P^{v}$	$+\varepsilon^{v}$
10.	$-\sin P'''$	$+\sin P'''$	0	$+\cos P'''$	$-\cos P'''$	0	$+\varepsilon''' \sin \pi'''$
11.	$-\sin P^{iv}$	0	$+\sin P^{iv}$	$+\cos P^{iv}$	0	$-\cos P^{iv}$	$+\varepsilon^{iv} \sin \pi^{iv}$
12.	0	$-\sin P^{v}$	$+\sin P^{v}$	0	$+\cos P^{v}$	$-\cos P^{v}$	$+\varepsilon^{v} \sin \pi^{v}$

The first six equations depend upon the measured distances; the last six depend on the measured angles. The weight of the first set and of the last set are, as we have just seen, practically equal, in this case.

In these equations of condition some terms vanish as below:

$$
\begin{aligned}
[ad] &= 0 = +\cos P.\ \sin P - \cos P.\ \sin P + \cos P''' \sin P''' + \cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} \\
&\qquad - \cos P''' \sin F''' - \cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} \\
[ae] &= 0 = -\cos P''' \sin P''' + \cos P''' \sin P''' \\
[af] &= 0 = -\cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} + \cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} \\
[bd] &= 0 = -\cos P''' \sin P''' + \cos P''' \sin P''' \\
[be] &= 0 = +\cos P' \sin P' - \cos P' \sin P' + \cos P''' \sin P''' + \cos P^{\mathrm{v}} \sin P^{\mathrm{v}} \\
&\qquad - \cos P''' \sin P''' - \cos P^{\mathrm{v}} \sin P^{\mathrm{v}} \\
[bf] &= 0 = -\cos P^{\mathrm{v}} \sin P^{\mathrm{v}} + \cos P^{\mathrm{v}} \sin P^{\mathrm{v}} \\
[cd] &= 0 = -\cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} + \cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} \\
[ce] &= 0 = -\cos P^{\mathrm{v}} \sin P^{\mathrm{v}} + \cos P^{\mathrm{v}} \sin P^{\mathrm{v}} \\
[cf] &= 0 = +\cos P'' \sin P'' - \cos P'' \sin P'' + \cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} - \cos P^{\mathrm{v}} \sin P^{\mathrm{v}} \\
&\qquad - \cos P^{\mathrm{iv}} \sin P^{\mathrm{iv}} - \cos P^{\mathrm{v}} \sin P^{\mathrm{v}}
\end{aligned}
$$

and consequently the normal equations will lack some terms.

Forming the following terms, we have

$$
\begin{aligned}
[aa] &= \cos^2 P + \sin^2 P + \cos^2 P''' + \cos^2 P^{\mathrm{iv}} + \sin^2 P''' + \sin^2 P^{\mathrm{iv}} &&= +3 \\
[bb] &= \text{etc., etc.} &&= +3 \\
[cc] &= \text{etc., etc.} &&= +3 \\
[dd] &= \text{etc., etc.} &&= +3 \\
[ee] &= \text{etc., etc.} &&= +3 \\
[ff] &= \text{etc., etc.} &&= +3 \\
[ab] &= -\cos^2 P''' - \sin^2 P''' &&= -1 \\
[ac] &= [bc] = [de] = [df] = [ef] &&= -1
\end{aligned}
$$

The normal equations are symbolically

$$
\begin{aligned}
[aa]\,\xi + [ab]\,\xi' + [ac]\,\xi'' + [ad]\,\eta + [ae]\,\eta' + [af]\,\eta'' + [an] &= 0 \\
[ab]\,\xi + [bb]\,\xi' + [bc]\,\xi'' + [bd]\,\eta + [be]\,\eta' + [bf]\,\eta'' + [bn] &= 0 \\
[ac]\,\xi + [bc]\,\xi' + [cc]\,\xi'' + [cd]\,\eta + [ce]\,\eta' + [cf]\,\eta'' + [cn] &= 0 \\
[ad]\,\xi + [bd]\,\xi' + [cd]\,\xi'' + [dd]\,\eta + [de]\,\eta' + [df]\,\eta'' + [dn] &= 0 \\
[ae]\,\xi + [be]\,\xi' + [ce]\,\xi'' + [de]\,\eta + [ee]\,\eta' + [ef]\,\eta'' + [en] &= 0 \\
[af]\,\xi + [bf]\,\xi' + [cf]\,\xi'' + [df]\,\eta + [ef]\,\eta' + [ff]\,\eta'' + [fn] &= 0
\end{aligned}
$$

or

$$
\begin{aligned}
1)&\quad +3\xi - \xi' - \xi'' + [an] = 0 \\
2)&\quad -\xi + 3\xi' - \xi'' + [bn] = 0 \\
3)&\quad -\xi - \xi' + 3\xi'' + [cn] = 0 \\
4)&\quad +3\eta - \eta' - \eta'' + [dn] = 0 \\
5)&\quad -\eta + 3\eta' - \eta'' + [en] = 0 \\
6)&\quad -\eta - \eta' + 3\eta'' + [fn] = 0
\end{aligned}
$$

in which $\xi = x - \alpha$, $\xi' = x' - \alpha'$, $\xi'' = x'' - \alpha''$ and $\eta = y - \beta$, $\eta' = y' - \beta'$, $\eta'' = y'' - \beta''$ where x, x', x'', and y, y', y'' are the relative $\Delta\delta$ and $\Delta\alpha$ of b, c, and d with respect to a.

The absolute terms of the equations are

For 1877, $n^{\mathrm{vii}} = +0''.15$; $n^{\mathrm{viii}} = +0''.15$; $n^{\mathrm{ix}} = -0''.06$; $n^{\mathrm{x}} = +0''.01$; $n^{\mathrm{xi}} = +0''.04$; $n^{\mathrm{xii}} = -0''.08$

and

For 1878, $n^{\mathrm{vii}} = +0''.22$; $n^{\mathrm{viii}} = +0''.18$; $n^{\mathrm{ix}} = -0''.03$; $n^{\mathrm{x}} = -0''.08$; $n^{\mathrm{xi}} = -0''.05$; $n^{\mathrm{xii}} = -0''.21$

So that the normal equations for the 1877 series are

$$\left.\begin{array}{l} 1+3\xi-\xi'-\xi''-0.14=0\\ 2-\xi+3\xi'-\xi''-0.05=0\\ 3-\xi-\xi'+3\xi''+0.19=0\\ 4+3\eta-\eta'-\eta''-0.20=0\\ 5-\eta+3\eta'-\eta''+0.06=0\\ 6-\eta-\eta'+3\eta''+0.13=0 \end{array}\right\}\text{whence}\left\{\begin{array}{l} \qquad\quad '' \\ \xi\ =+0.035\\ \xi'\ =+0.013\\ \xi''=-0.048\\ \eta\ =+0.052\\ \eta'\ =-0.013\\ \eta''=-0.030 \end{array}\right.$$

and those for 1878 are

$$\left.\begin{array}{l} 1+3\xi-\xi'-\xi''-0.02=0\\ 2-\xi+3\xi'-\xi''-0.27=0\\ 3-\xi-\xi'+3\xi''+0.29=0\\ 4+3\eta-\eta'-\eta''-0.35=0\\ 5-\eta+3\eta'-\eta''+0.08=0\\ 6-\eta-\eta'+3\eta''+0.27=0 \end{array}\right\}\text{whence}\left\{\begin{array}{l} \qquad\quad '' \\ \xi\ =+0.005\\ \xi'\ =+0.068\\ \xi''=-0.073\\ \eta\ =+0.087\\ \eta'\ =-0.020\\ \eta''=-0.068 \end{array}\right.$$

Applying these corrections, ξ, ξ', ξ'', η, η', η'', to α, α', α'', and β, β', β'', we obtain the most probable values of x, x', x'' ($\Delta\delta$) and y, y', y'' ($\Delta\alpha$).

For 1877, $x=+8''.638$ $x'=+6''.536$ $x''=+16''.017$ $y=-9''.846$ $y'=+11''.810$ $y''=-5''.100$
For 1878, $x=+8''.611$ $x'=+6''.462$ $x''=+15''.933$ $y=-9''.903$ $y'=+11''.766$ $y''=-5''.094$

These corrections are of equal weight, and the probable error of a correction in 1877 is ±0''.033, in 1878 ±0''.050.

From these values of x, x', x'', and y, y', y'', the concluded values of P, P' . . . . P^{v} and d, d' . . . . d^{v} are computed. They are given in the last two columns of the following table for comparison with other measures:

Observer. Epoch.	W. HERSCHEL. 1780.13.	South. 1820.56.	South. 1824.58.	W. STRUVE. 1836.15.	LIAPONOFF. 1849.07.	O. STRUVE. 1870.0.	NOBILE. 1876.13.	HALL. 1877.15.	HALL. 1878.16.	JEDRZJEWICZ.* 1878?
		° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
ab	. .	314 2	310 48	311 31.3	311 45.2	311 32.4	311 40.4	311 13.7	311 0.5	311 36.2
ac	. .	60 34	60 6	60 19.5	60 55.8	60 22.3	61 20.6	61 6.0	61 13.4	60 58.8
ad	. .	345 4	345 3	342 7.4	343 30.2	342 5.4	342 54.0	342 20.4	342 16.2	342 44.0
be	. .	95 33	. . .	95 23.2	94 45.8	95 36.1	95 38.5	95 34.2	95 39.8	95 37.3
bd	. .	30 48	. . .	31 38.1	32 21.2	31 43.4	32 11.8	32 37.4	33 17.8	31 57.0
cd	. .	301 2	. . .	299 19.8	299 3.0	299 34.4	299 22.8	299 22.4	299 19.5	299 33.3
	″	″	″	″	″	″	″	″	″	″
ab	12.81	12.62	13.453	12.995	12.671	13.049	12.79	13.114	13.123	12.906
ac	14.27	13.70	13.582	13.339	13.693	13.276	13.72	13.478	13.431	13.300
ad	. .	17.07	16.685	16.832	16.602	16.876	16.56	16.822	16.725	16.870
bc	. .	21.15	. .	21.413	21.495	21.410	21.38	21.743	21.776	21.396
bd	9.06:	9.08	. .	8.696	8.856	8.705	8.61	8.789	8.760	8.855
cd	20.52	19.08	. .	19.221	19.083	19.237	19.15	19.393	19.338	19.238

* *Astronomische Nachrichten*, No. 2279, bd. 95, col. 357. These measures are not corrected for refraction.

From this table the following differences ΔP . . . ., Δd . . . . . of each observer's results compared with W. STRUVE's are formed:

Observers.	Interval in years.	ΔP (a and b)	$\Delta P'$ (a and c)	$\Delta P''$ (a and d)	$\Delta P'''$ (b and c)	ΔP^{iv} (b and d)	ΔP^{v} (c and d)
	y.	′	′	′	′	′	′
L − Σ	12.92	+ 13.9	+ 36.3	+ 82.8	− 37.4	+ 43.1	− 16.8
N − Σ	39.98	+ 9.1	+ 61.1	+ 46.6	+ 15.3	+ 33.7	+ 3.0
OΣ − Σ	. .	+ 1.1	+ 2.8	− 2.0	+ 12.9	+ 5.3	+ 14.6
H¹ − Σ	41.00	− 17.6	+ 46.5	+ 13.0	+ 11.0	+ 59.3	+ 2.6
H² − Σ	42.01	− 30.8	+ 53.9	+ 8.8	+ 16.6	+ 99.7	− 0.3
		Δd	$\Delta d'$	$\Delta d''$	$\Delta d'''$	Δd^{iv}	Δd^{v}
		″	″	″	″	″	″
L − Σ	12.92	− 0.324	+ 0.364	− 0.230	+ 0.082	+ 0.160	− 0.138
N − Σ	39.98	− 0.205	+ 0.381	− 0.272	− 0.033	− 0.086	− 0.071
OΣ − Σ	. .	+ 0.054	− 0.063	+ 0.044	− 0.003	+ 0.009	+ 0.016
H¹ − Σ	41.00	+ 0.119	+ 0.139	− 0.010	+ 0.330	+ 0.093	+ 0.172
H² − Σ	42.01	+ 0 128	+ 0.092	− 0.107	+ 0.363	+ 0.064	+ 0.117

The data in the column "O. STRUVE" were kindly furnished me by Dr. STRUVE in MS., and are the results of a new reduction of his work by M. DUBIAGO in 1879 The figures differ slightly from those previously published in *Observations de Poulkova*, volume ix, p. 53, and are to be considered as final. They are reduced to 1870.0.

For comparison with them, I give in the table below the corresponding data of W. STRUVE and of HALL, reduced to the same epoch. The figures at the head of the columns, 1836.15 and 1877.66, are the epochs of the measures:

Observer. Epoch.		W. STRUVE. 1836.15.	O. STRUVE. 1870.00.	A. HALL. 1877.66.
		° ″	° ″	° ″
P	ab	311 45.3	311 32.4	311 3.9
	ac	60 29.0	60 22.3	61 7.5
	ad	342 20.4	342 5.4	342 15.3
	bc	95 35.2	95 36.1	95 34.2
	bd	31 47.6	31 43.4	32 55.4
	cd	299 33.5	299 34.4	299 17.7
		″	″	″
d	ab	13.002	13.049	13.116
	ac	13.344	13.276	13.453
	ad	16.854	16.876	16.768
	bc	21.414	21.410	21.758
	bd	8.706	8.705	8.772
	cd	19.227	19.237	19.363

From this table we may form the differences:

Observers.	Interval in years.	ΔP (a and b)	$\Delta P'$ (a and e)	$\Delta P''$ (a and d)	$\Delta P'''$ (b and c)	ΔP^{iv} (b and d)	ΔP^{v} (c and d)
OΣ − Σ	33.85	− 12′.9	− 6′.7	− 15′.0	+ 0′.9	− 4′.2	+ 0′.9
H − Σ	41.51	− 41.4	− 21.5	− 5.1	− 1.0	+ 7.8	+ 15.8
		Δd	$\Delta d'$	$\Delta d''$	$\Delta d'''$	Δd^{iv}	Δd^{v}
		″	″	″	″	″	″
OΣ − Σ	33.85	+ 0.047	− 0.068	+ 0.022	− 0.004	− 0.001	+ 0.010
H − Σ	41.81	+ 0.114	+ 0.109	− 0.086	+ 0.344	+ 0.066	+ 0.136

Although the residuals in the table at the top of page 17 are difficult to reconcile with a particular scheme of geometrical change, they are too large and agree too well with each other (particularly in the case of $\varDelta P$, $\varDelta d$) to attribute them exclusively to accidental errors. It would appear certain that the angle P has diminished and the distance d (and therefore the distance d''') has increased, and hence that these stars are physically connected, provided these changes are not due to proper motion.

My friend, Professor Lewis Boss, director of the Dudley Observatory, has kindly sent me the following memorandum, from which it appears that the proper motion of *θ′ Orionis* (*a*) is extremely small:

Position and Proper Motion of θ′ Orionis (3d Star) for 1875.0.

Right Ascension. (Newcomb.)

Catalogue.	Mean date.	Catalogue Right Ascension.	No. of obs.	Weight.	Correct'n.	Obs'd α.	Computed.	C – O
		h. m. s.			s.	s.	s.	s.
Bradley, 1755 . . .	1755	5 23 14.83	3	.5	– .02	14.81	14.83	+ .02
Struve, 1830 . . .	1830	26 55.66	7	1.5	– .03	55.63	55.60	– .03
Armagh, 1840 . . .	1829	27 25.11	1	.3	+ .04	25.05	25.06	– .09
Henderson, 1838 . .	1838	27 19.19	3	1.0	+ .03	19.22	19.16	– .06
Greenwich, 1840 . .	1838	27 24.95	5	1.5	+ .04	24.99	25.06	+ .07
Oxford, 1860 . . .	1858	28 23.92	3	.5	– .03	23.89	23.97	+ .08
Schjellerup, 1860 . .	1863	28 38.21	1	0	+ .07	38.28	38.70	[+ .42]
Yarnall, 1860 . . .	1870	5 28 23.99	6	1.5	– .02	23.97	23.97	.00

$$\text{Concluded A. R. } 1875.0 \quad 5^{h}\ 29^{m}\ 08^{s}.163 + 2^{s}.9465\,(T - 1875) + 0^{s}.166\left(\frac{T-1875}{100}\right)^{2}$$

$$\mu = +\,0^{s}.0012 \pm {}^{s}.0008 \qquad\qquad - {}^{s}.0035\left(\frac{T-1875}{100}\right)^{3}$$

Declination. (Boss.)

		° ′ ″			″	″	″	″
Bradley, 1755 . . .	1755	5 34 21.8	1	.1	+ .3	21.5	20.4	+ 1.1
Struve, 1830 . . .	1830	30 31.8	7	2.0	– .4	32.2	31.9	+ .3
Henderson, 1843 . .	1843	29 53.1	2	.4	+ .5	52.6	54.7	– 1.2
Greenwich, 1845 . .	1847	29 47.97	4	.7	+ .1	47.9	49.1	– 2.1
Oxford, 1860 . . .	1860	29 08.9	4	.4	+ .7	08.2	07.2	+ 1.0
Schjellerup, 1865 . .	1863	28 48.6	1	.0	+ 1.0	47.6	53.5	(– 5.7)
Yarnall, 1860 . . .	1870	5 29 08.2	3	.4	– .4	08.6	07.2	+ 1.4

$$\text{Concluded } 1875.0\ \delta = -\,5^{\circ}\ 28'\ 26''.31 + 2''.694\,(T - 1875) - 21''.37\left(\frac{T-1875}{100}\right)^{2}$$

$$\mu^{1} = +\,0.''003 \pm .''019 \qquad\qquad - .''02\left(\frac{T-1\,875}{100}\right)^{3}$$

The table appears to me, therefore, to show a change in the relative position of the stars since 1836.15, the epoch of STRUVE's work, but the amount of this change is quite uncertain.

Perhaps the most definite conclusion which we are justified in drawing is that the stars of the trapezium of Orion do, in fact, form one physical system, as stated by STRUVE, LIAPONOFF, and NOBILE.

CONCLUDED RELATIVE POSITIONS OF THE FOUR PRINCIPAL STARS FROM BOTH SERIES OF WASHINGTON OBSERVATIONS.

The epoch of the first series of Professor HALL's observations is 1877.15, of the second, 1878.16.

The annual increase of position-angle is $\Delta p_0 = n.\ \sin \alpha_0.\ \sec \delta_0$* or +0′.332. The correction for aberration for a distance of 10″, from 1877.15 to 1877.00, is −0″.00084; from 1878.16 to 1878.00 it is −0″.00085.

The correction for the position-angles for precession, etc., from 1877.15 to 1877.00, is −0′.06; from 1878.16 to 1878.00 it is −0′.10.

The 1877 series, reduced to 1877.00, gives

	ab	*ac*	*ad*	*bc*	*bd*	*cd*
P	311° 13′.67;	61° 5′.91;	342° 20′.32;	95° 34′.11;	32° 37′.34;	299° 22′.29
d	13″.113;	13″.477;	16″.821;	21″.741;	8″.788;	19″.391

Reducing this to 1878.00 the distances remain the same, and the angles are all increased by 0′.33.

The 1878 series, reduced to 1878.00, gives

	ab	*ac*	*ad*	*bc*	*bd*	*cd*
P	311° 0′.40;	61° 13′.33;	342° 16′.12;	95° 39′.72;	33° 17′.68;	299° 19′.40
d	13″.122;	13″.430;	16″.724;	21″.774;	8″.759	19″.336

The two series I shall consider as of equal weight. The concluded final positions of these stars for 1878.00 are, then,

	°	′		″
$P =$	311	7.2	$d =$	13.118
$P' =$	61	9.8	$d' =$	13.454
$P'' =$	342	18.4	$d'' =$	16.773
$P''' =$	95	37.1	$d''' =$	21.758
$P^{\text{iv}} =$	32	57.7	$d^{\text{iv}} =$	8.774
$P^{\text{v}} =$	299	21.0	$d^{\text{v}} =$	19.364

POSITIONS OF THE FIFTH AND SIXTH STARS OF THE TRAPEZIUM.

The Washington Observations of the fifth and sixth stars for 1877 and 1878 are given in the following table:

After each year's series are also given the co-ordinates y and x ($\Delta\alpha$ and $\Delta\delta$) of each of the smaller stars referred to the larger star with which its p and s have been measured. These co-ordinates have been freed from the effects of refraction, erroneous position of the pole of the instrument, and are reduced to 1878.00 in each case, assuming that the epochs of the two series were 1877.15 and 1878.16.

CHAUVENET'S Astronomy, vol. ii, pp. 467–8.

Washington Observations of the Fifth and Sixth Stars.

a and *a′*. *c* and *a′*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Jan. 30	− 1 24	119.2	4.15	Mar. 23	+ 1 39	225.63	12.08
Feb. 6	− 0 48	121.2	3.96	25	+ 1 43	224.13	12.00
9	− 1 30	122.0	4.04				
10	− 1 18	120.7	3.87				
$1878.00\begin{cases} y = +3''.431 \\ x = -2''.066 \end{cases}$				$1878.00\begin{cases} y = -8''.480 \\ x = -8''.546 \end{cases}$			

d and *a′*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Feb. 11	− 1 24	155.4	19.93	Mar. 5	+ 1 31	154.27	19.96
15	− 1 36	155.0	19.95	22	− 1 7	154.23	20.09
28	+ 0 36	154.8	20.11	23	+ 1 13	154.43	20.01
Mar. 10	+ 0 42	154.9	19.93				
20	+ 1 12	154.2	19.72				
$1878.00\begin{cases} y = +\ 8''.381 \text{ wt. } 5 \\ x = -18''.088 \text{ wt. } 5 \end{cases}$				$1878.00\begin{cases} y = +\ 8''.714 \text{ wt. } 3 \\ x = -18''.033 \text{ wt. } 3 \end{cases}$ From both series. $1878.00\begin{cases} y = +\ 8''.506 \\ x = -18''.067 \end{cases}$			

b and *b′*. *c* and *b′*.

Date.	*t*	*p*	*s*	Date.	*t*	*p*	*s*
1877.	h. m.	°	″	1878.	h. m.	°	″
Jan. 30	− 1 6	351.7	4.10	Mar. 23	+ 2 5	285.43	23.15
Feb. 6	− 0 36	352.3	4.29	April 8	+ 2 43	285.45	23.02
9	− 1 18	351.2	4.21				
10	− 1 6	351.0	4.24				
$1878.00\begin{cases} y = -0''.599 \\ x = +4''.167 \end{cases}$				$1878.00\begin{cases} y = -22''.261 \\ x = +\ 6''.106 \end{cases}$			

d and *b*′.

Date.	t	p	s	y	x	Date.	t	p	s
1877.	h. m.	°	″	″	″	1878.	h. m.	°	″
Feb. 11	− 0 48	239.6	6.16	5.14	3.21	Mar. 23	+ 2 31	238.53	6.38
14	− 1 12	240.5	6.28	5.47	3.09	25	+ 2 1	237.37	. .
15	− 0 48	240.4	6.33	5.50	3.13	26	+ 1 49	239.15	6.53
28	+ 0 48	240.1	6.17	5.35	3.08				
Mar. 7	+ 0 54	239.6	. .	. .	. .				
10	+ 0 24	240.8	6.25	5.46	3.05				
20	+ 1 0	238.0	6.19	5.25	3.28				

$$1878.00 \begin{cases} y = -5''.279 \text{ wt. } 6 \\ x = -3''.102 \text{ wt. } 6 \end{cases}$$

$$1878.00 \begin{cases} y = -5''.478 \text{ wt. } 2 \\ x = -3''.390 \text{ wt. } 2 \end{cases}$$

From both series.

$$1878.00 \begin{cases} y = -5''.329 \\ x = -3''.174 \end{cases}$$

Collecting these measured co-ordinates for 1878.0, we have

Observed.				Computed.			
Pair of Stars.	y 1878.0.	x 1878.0.	No. of nights.	Pair of Stars.	y 1878.0.	x 1878.0.	Weight.
	″	″			″	″	
a and *a*′	+ 3.431	− 2.066	4	*a* and *a*′	+ 3.431	− 2.066	4
c and *a*′	− 8.480	− 8.546	2	*a* and *a*′	+ 3.306	− 2.057	2
d and *a*′	+ 8.506	− 18.067	8	*a* and *a*′	+ 3.408	− 2.087	8
				Mean	+ 3.400	− 2.077	14
	″	″			″	″	
b and *b*′	− 0.599	+ 4.167	4	*a* and *b*′	− 10.481	+ 12.794	4
c and *b*′	− 22.261	+ 6.106	2	*a* and *b*′	− 10.475	+ 12.595	2
d and *b*′	− 5.329	+ 3.174	9	*a* and *b*′	− 10.427	+ 12.806	9
				Mean	− 10.448	+ 12.775	15

Hence, the positions of *a*′ and *b*′, with reference to *a* and *b*, are

a and *a*′	$p' = 121° \ 25'.2$	$s' = 3''.984$	1878.00	(14 nights).
a and *b*′	$p'' = 320° \ 43'.3$	$s'' = 16''.504$	1878.00	(15 nights).
b and *b*′	$p''' = 352° \ 8'.0$	$s''' = 4''.194$	1878.00	(15 nights).

Of the smaller stars we have the following measures by other observers:

a and *a*′.

Observer.	Epoch.	*p*	*s*	No. of days.
		°	″	
J. Herschel. . . .	1836.50	117.15	. .	2
Dawes	43.51	124.52	3.122	2
O. Struve	46.66	125.90	3.285	2
O. Struve	58.85	128.82	3.926	5
Dembowski	67.00	126.00	3.96	5
O. Struve	70.70	131.50	3.825	2
Hall	1878.00	121.42	3.984	14

b and *b*′.

Observer.	Epoch.	*p*	*s*	No. of days.
		°	″	
W. Struve	1832.53	353.60	3.865	7
Dawes	41.92	352.54	3.828	2
O. Struve	59.62	350.78	4.295	4
O. Struve	70.70	348.90	4.230	2
Hall	1878.00	352.13	4.194	15

These would also appear to indicate tolerably consistent changes in relative position.

For comparison, a good series of observations on *a*′ and *b*′ should be made about 1890.

It appears that after making due allowance for the unavoidable accidental and systematic errors the comparison of all our measures on the six stars of this system show their probable physical association.

APPENDIX III—1877.

A value of

THE SOLAR PARALLAX

FROM

MERIDIAN OBSERVATIONS OF MARS IN 1877.

BY

J. R. EASTMAN,

PROFESSOR OF MATHEMATICS, UNITED STATES NAVY.

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UNITED STATES NAVAL OBSERVATORY,
Washington, D. C., July 29, 1881.

SIR: I have the honor to submit the following report of the observations of Mars and Comparison Stars made, under my direction, at this Observatory in 1877, together with a determination of a value of the Solar Parallax from a combination of the observations of Mars and Comparison Stars made at the observations at Melbourne, Sydney, Cape of Good Hope, Leyden, Cambridge, and Washington. Final data were not received from all the stations until July, 1881, hence the delay in presenting this paper.

Very respectfully,

J. R. EASTMAN,
Professor of Mathematics, U. S. N.

Rear-Admiral JOHN RODGERS, U. S. N.,
Superintendent United States Naval Observatory.

A VALUE OF THE SOLAR PARALLAX FROM MERIDIAN OBSERVATIONS OF MARS AT THE OPPOSITION IN 1877.

In September, 1876, a copy of the following paper, with the indorsement of Rear-Admiral C. H. DAVIS, U. S. N., Superintendent of the Naval Observatory, was sent to each of the principal observatories of the world, and their active co-operation in the proposed work was earnestly solicited:

UNITED STATES NAVAL OBSERVATORY,
Washington, August 20, 1876.

SIR: I have the honor to transmit herewith a paper on the approaching opposition of Mars, and to commend it to your favorable consideration.

If the co-operation of other observatories can be secured, a complete set of observations will be made at this observatory with the Transit Circle.

It will afford me great pleasure to receive an early and favorable response to this communication.

Very respectfully, your obedient servant,

C. H. DAVIS,
Rear-Admiral U. S. N., Superintendent.

To the DIRECTOR OF THE ———.

[CIRCULAR LETTER.]

THE OPPOSITION OF MARS IN 1877.

The determination of the solar parallax, within desirable limits of error, is still a work of the future, and it behooves astronomers not to leave untried any method that promises to yield valuable aid in the solution of this important problem.

The deep and general interest in this problem has lately been manifested by the liberal grants which were made by the principal governments of the world to enable astronomers to test thoroughly the value of those methods depending on the observations of the transit of Venus under favorable circumstances.

The opposition of Mars in 1877 will afford a favorable opportunity for employing observations of this planet in the determination of the solar parallax with little or no extra expense to those governments or individuals already provided with meridian circles in fixed observatories.

The accuracy with which some of the similar observations of Mars were made in 1862 affords strong grounds for the belief that better results may be obtained by this method than have been reached by any method heretofore, and makes it very desirable that astronomers should make a combined effort on a suitable plan, previously arranged, to observe the planet in 1877.

In pursuance of this idea, I venture to propose the following method of observing, which is given in detail, in order that all the observations may be made in the same way, and to annex a list of stars favorably situated for comparison.

This method of observing, with a few exceptions, is essentially the same as that proposed by Dr. A. WINNECKE in 1862, and followed by him in his excellent observations with the meridian circle at Pulkowa.

METHOD OF OBSERVING.

1. It is essential that all the observatories in the southern hemisphere which have suitable instruments should participate in the observations, and at least an equal number north of the equator.

2. In order to eliminate all errors depending on the positions of the comparison-stars, every observer should, in every instance, observe those stars selected for the given night, and in no case depart from this rule.

3. The observations should commence on July 18 and continue on every favorable night until October 21.

4. With instruments of less than six inches aperture, no attempt should be made to observe the transit of the planet or stars further than to note to the nearest second

the time of the bisection of the object, unless it is made at some vertical wire whose distance from the center of the field is known; and only one bisection of the object should be made, that being, if possible, near the center of the field.

With larger and more stable instruments, the right ascension of the stars and of the first and second limbs of the planet may be observed, and at least two bisections made, one before and one after the observation of transits, at equal or known distances from the middle field. Unless a chronograph is used, no transit observations should be attempted in any case.

5. The method of obtaining the position of the center of Mars proposed by Dr. WINNECKE in 1862 has such merit, and is so readily applicable to most instruments that it is desirable that it be adopted in 1877. Substantially, the method is as follows:

Two threads of equal size are inserted in the movable declination system of the field of the telescope, the distance between them being 3″ or 4″ less than the minimum diameter of the planet during the proposed period of observation. The observation is effected by moving these threads until the two small segments of the planet outside of the threads are seen to be exactly equal.

If the thread nearest the micrometer head is designated as thread *a* and the other as thread *b*, then the comparison stars should be observed by bisecting the *first*, *fourth*, *fifth*, and *eighth* stars with thread *a*, and the *second*, *third*, *sixth*, and *seventh* stars with thread *b*. This order should be reversed on alternate nights; but in all cases the thread used in bisecting ought to be carefully recorded for each star.

6. The inclination of the declination threads should be carefully determined at least twice during the period from July 18 to October 21.

7. The division errors of the circles used should be carefully investigated, at least in the vicinity of those divisions employed in the observations.

8. Whenever the microscope threads are moved more than 12″, the microscopes should be read for each adjacent division.

9. In making the bisections the telescope-micrometer should be moved in all cases towards the spring against which it acts.

10. The periodic errors of *all* the micrometer screws should be investigated.

11. It is desirable that an ocular of a power of 150, at least, be used on all instruments, the larger ones using a power of from 150 to 190.

THE OBSERVING-LIST.

The comparison stars have been so selected that the transit of four in each group takes place *before* the planet and four *afterward*, and, also, so that the mean declination of these stars is nearly the same as the mean declination of Mars for the time each group of eight stars is used.

The positions of the stars in the following list are the approximate places for 1877.0, and the positions of Mars are given for the time of transit at Greenwich.

The time is divided into three periods, and the positions of Mars are given for the beginning and end of each period, and also for those days when the maximum and minimum right ascensions occur in each period.

Observing-List from July 18 to August 28, inclusive.

Date.	Object.	Mag.	α			δ	
			h.	m.	s.	°	′
	74 Aquarii	6	22	47	0	− 12	16.2
	h^1 Aquarii	6	22	58	45	8	21.4
	Weisse 76	7	23	6	34	10	14.4
	ψ^2 Aquarii	5	23	11	31	9	51.3
July 18	Mars	.	23	19	24	9	55.9
Aug. 6	Mars	.	23	28	36	9	56.9
Aug. 28	Mars	.	23	17	1	11	33.1
	B. A. C. 8239	6	23	34	48	12	21.7
	B. A. C. 8266	6	23	40	56	12	35.4
	B. A. C. 8285	6	23	43	54	10	39.8
	Weisse 985	7	23	49	27	− 13	50.1

From August 29 to September 16, inclusive.

Date.	Object.	Mag.	h.	m.	s.	°	′
	64 Aquarii	6½	22	32	48	− 10	40.0
	70 Aquarii	6	22	42	2	11	12.3
	74 Aquarii	6	22	47	0	12	16.2
	B. A. C. 8004	7	22	53	8	13	43.7
Aug. 29	Mars	.	23	16	2	11	38.3
Sept. 16	Mars	.	22	57	18	12	44.1
	Weisse 394	7	23	21	2	13	36.2
	B. A. C. 8199	7	23	25	50	12	13.2
	B. A. C. 8221	6	23	31	17	13	44.5
	B. A. C. 8266	6	23	40	56	− 12	35.4

From September 17 to October 21, inclusive.

Date.	Object.	Mag.	h.	m.	s.	°	′
	50 Aquarii	6	22	17	52	− 14	9.2
	σ Aquarii	5	22	24	8	11	18.4
	64 Aquarii	6½	22	32	48	10	40.0
	70 Aquarii	6	22	42	2	11	12.3
Sept. 17	Mars	.	22	56	23	12	45.4
Oct. 7	Mars	.	22	46	44	12	3.4
Oct. 21	Mars	.	22	51	25	10	25.5
	Weisse 1241	7	22	59	51	10	15.1
	Weisse 76	7	23	6	34	10	14.4
	ψ^2 Aquarii	5	23	11	31	9	51.3
	97 Aquarii	6	23	16	12	− 15	42.8

J. R. EASTMAN,
Professor of Mathematics, United States Navy.

UNITED STATES NAVAL OBSERVATORY, *June* 20, 1876.

A sufficient number of favorable responses were received from southern observatories to warrant the belief that ample co-operation would be given in the southern hemisphere, while many promises of assistance were received from northern observatories.

OBSERVATIONS AT THE UNITED STATES NAVAL OBSERVATORY.

The observations at this Observatory were made with the PISTOR and MARTIN'S Transit Circle of 8.52 inches aperture and 12.06 feet focal length. The eye-piece used magnified 186 diameters. In the principal focus of the objective is a fixed reticule of fifteen vertical threads. The notation and the approximate equatorial intervals between each vertical thread and the *mean* of sets B and D and c_2, c_3, and C_4 are as follows:

TABLE I.

	s.		s.		s.
I	36.8	C_1	4.1	D_1	8.2
II	24.5	C_2	2.0	D_2	9.7
III or B_1	12.3	IV or C_3	0.0	V or D_3	12.3
B_2	9.7	C_4	2.0	VI	24.5
B_3	8.2	C_5	4.1	VII	36.8

The zenith-distance micrometer is usually provided with *four* threads, two of which are about 3″ apart, and the center of the space between them is regarded as the standard middle thread. The other threads are placed at a distance of about 10 revolutions or 2′ 33″ on either side of the middle threads; that nearest the head of the micrometer is known as thread A and the other thread B. For the observation of Mars, a fifth thread was inserted at about 11.16 revolutions from the middle threads, or 17″.75 beyond B. On August 4, it was found that the fifth thread, known as thread *b*, interfered with the movable vertical thread. Thread *b* was taken out, a new score was cut, and a new thread inserted at a distance of 21″.64 from B.

METHOD OF OBSERVING.

In 1877, the setting circle of the Transit Circle indicated zenith-distance south. When the zenith-distance of the object to be observed had been computed, the circle was set on the *next less even minute*, so as to bring the object always on the same side of the center of the field. For example, if the computed circle-reading was 49° 31′.6, the circle would be set on 49° 30′. By this method, the reading of the circle microscopes would seldom vary from one object to another more than 5″, and the effect of the unknown errors of those instruments would be eliminated. Therefore, the motion necessary to reach the object in the field devolves upon the telescope-micrometer, requiring at the most *eight* revolutions of the screw. This screw has been frequently examined throughout the portion in ordinary use, and the adopted value, one revolution = 15″.312, seems to require no change.

In observing, the instrument was set before the transit time of the object, and the four microscopes read. In its passage across the field, Mars was bisected with threads B and *b*, as proposed in the circular, at the vertical threads I and II, the transits of the preceding limb observed over the threads of sets B and D, the transits of the following limb over the threads of set C, and then it was bisected at the vertical threads VI and VII. The microscopes were again read and the proper records made. In the case of a comparison star the same method was followed, except that it was bisected by either thread B or *b*, care being taken to bisect half the stars with B and half with *b*. The barometer and thermometers were read at the beginning and at the end of the work, and occasionally, when any unusual change was suspected, they were read at the transit of Mars. The mean of the two readings of the microscopes was adopted as the true reading.

The observers were Prof. J. R. EASTMAN, U. S. N., and Assistant Astronomers E. FRISBY, A. N. SKINNER, and H. M. PAUL, and in the tabulated list of observations they are respectively designated by the initials E., F., S., and P.

THE REDUCTIONS.

Mars and the comparison stars were reduced to apparent north polar distance by the ordinary methods, using the zenith-point correction, determined in the usual way over mercury; for the latitude + 38° 53′ 38″.80, and for refraction, the quantity computed from BESSEL's tables, employing the tables given in the Appendix to the Washington Observations for 1845.

The apparent north polar distances were further corrected for errors of division, flexure of telescope, and flexure of circle, and in the case of Mars for defective illumination.

The north polar distances given in the list of observations have received the above corrections.

TABLE II.

THE WASHINGTON OBSERVATIONS.

First Series.

Date	July 29.6.	July 30.6.	August 6.6.	August 18.5.
Observer	S.	P.	S.	F.
Object.	Apparent North Polar Distance.			
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 54.14	54.12	53.21	51.21
λ^1 Aquarii	98 21 7.98	7.70	6.84	4.24
Weisse 76	100 13 59.96	59.38	59.02	57.33
ψ^3 Aquarii	99 50 53.96	54.66	53.32	51.27
Mars	99 45 26.27	99 46 3.47	99 57 45.63	100 43 29.82
B. A. C. 8239	102 21 24.03	24.49	23.44	20.56
B. A. C. 8286	102 35 7.23	6.26	6.45	3.12
B. A. C. 8285	100 39 17.42	16.18	16.04	13.60
Weisse 985	103 49 42.72	42.73	41.87	40.05

TABLE II.—Continued.

THE WASHINGTON OBSERVATIONS.

First Series.

Date	August 21.5.			August 27.5.			August 28.5.		
Observer	E.			S.			E.		
Object.	Apparent North Polar Distance.								
	°	′	″	°	′	″	°	′	″
74 Aquarii			51.55			52.51			51.63
h^1 Aquarii			4.67			4.45			5.11
Weisse 76			56.20			57.49			57.12
ψ^2 Aquarii			50.90			51.44			51.16
Mars	100	58	16.94	101	29	24.88	101	34	35.83
B. A. C. 8239			20.77			22.37			21.78
B. A. C. 8266			4.30			4.70			4.72
B. A. C. 8285			13.30			14.38			13.87
Weisse 985			40.05			40.76			40.38

Second Series.

Date	September 1.5.			September 3.5.			September 15.5		
Observer	F.			F.			F.		
Object.	Apparent North Polar Distance.								
	°	′	″	°	′	″	°	′	″
64 Aquarii	100	39	41.36			40.55			41.75
70 Aquarii	101	11	55.69			54.92			55.71
74 Aquarii	102	15	51.08			50.42			51.56
B. A, C. 8004	103	43	24.55			24.64			25.53
Mars	101	54	43.79	102	4	9.36	102	43	17.19
Weisse 394	103	35	57.64			56.88			. .
B. A. C. 8199	102	12	58.48			58.17			. .
B. A. C. 8221	103	44	5.29			5.41			. .
B. A. C. 8266	102	35	3.79			3.09			. .

TABLE II—Continued.

THE WASHINGTON OBSERVATIONS.

Third Series.

Date	September 21.5.	September 24.4.	September 26.4.	October 1.4.
Observer	F.	F.	P.	F.
Object.	Apparent North Polar Distance.			
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 48.13	48.25	49.19	48.69
σ Aquarii	101 18 4.09	3.14	4.16	4.60
64 Aquarii	100 39 42.46	40.43	40.96	41.29
70 Aquarii	101 11 55.31	54.71	55.45	55.37
Mars	102 47 25.59	102 45 9.53	102 42 3.41	102 28 43.07
Weisse 1241	100 15 40.28	42.38	42.62	41.73
Weisse 76	100 13 55.74	55.31	55.95	55.77
ψ^2 Aquarii	99 50 49.69	50.29	50.49	50.62
97 Aquarii	105 42 26.86	28.43	28.05	27.33
Date	**October 2.4.**	**October 6.4.**	**October 9.4.**	**October 12.4.**
Observer	P.	F.	P.	F.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	48.31	48.91	. .	49.09
σ Aquarii	3.96	4.19	. .	4.67
64 Aquarii	41.53	41.03	40.50	41.51
70 Aquarii	55.26	. .	54.81	55.85
Mars	102 25 6.37	102 7 41.59	101 51 33.79	101 32 57.69
Weisse 1241	42.43	42.28	42.04	42.28
Weisse 76	56.02	56.48	55.87	56.27
ψ^2 Aquarii	50.28	50.55	. .	50.22
97 Aquarii	28.06	29.49	. .	29.83
Date	**October 14.4.**	**October 15.4.**	**October 17.4.**	**October 18.4.**
Observer	P.	E.	S.	P.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	49.79	51.11	49.60	51.23
σ Aquarii	4.96	5.67	4.78	5.89
64 Aquarii	42.29	41.40	42.51	43.09
70 Aquarii	56.57	56.94	55.84	56.90
Mars	101 19 15.72	101 12 2.91	100 56 53.42	100 48 58.77
Weisse 1241	43.22	43.46	42.64	43.82
Weisse 76	56.70	56.87	56.32	58.13
ψ^2 Aquarii	50.34	51.46	50.28	51.49
97 Aquarii	28.35	28.85	28.84	29.77

OBSERVATIONS AT OTHER OBSERVATORIES.

This Observatory has received observations and results of observations of Mars and comparison stars from the following observatories:

KREMSMÜNSTER.

Results of observations were received from the observatory at Kremsmünster. but as no details whatever in regard to the methods of making or reducing the observations were received, no use has been made of the work.

SAN FERNANDO.

From San Fernando the unreduced observations were received, with no description whatever of the instrument or of the method of observing, and the work was not used.

MELBOURNE.

The observations at Melbourne were made by Messrs. E. J. White and J. E Gilbert with the Transit Circle.

No description of the method of observing has been furnished, and such data can only be inferred from the printed sheets issued in pamphlet form, without any description or explanation.

From this pamphlet it appears that Mars was observed with a single thread, and two bisections of each limb were made at each transit. The bisections of the limbs of Mars were made at the vertical threads A, C, E, and G, and one bisection of each star was made at the vertical thread D.

The ordinary corrections were applied, and also the corrections for flexure, errors of division and defective illumination.

The days on which Mars, with four or more comparison stars, was observed are given in the table below, together with the number of stars:

Table III.

Day.	Stars.	Day.	Stars.	Day.	Stars.	Day.	Stars.
1877. July 21	6	1877. Aug. 14	5	1877. Sept. 6	8	1877. Oct. 4	8
22	8	15	6	7	8	5	8
23	8	16	8	15	6	7	8
27	8	17	8	16	6	8	8
28	8	21	8	17	8	9	7
29	8	23	4	18	5	10	8
30	8	24	8	22	8	11	8
Aug. 3	8	25	7	24	7	12	8
7	8	27	8	25	7	14	8
8	8	28	8	26	8	15	7
9	8	29	8	27	8	16	8
10	8	30	8	28	5	18	5
11	8	Sept. 1	8	Oct. 1	4	21	6
12	8	2	8	2	8	22	8
13	8	5	8	3	8		

CAPE OF GOOD HOPE.

The observations at the Cape of Good Hope were made with the Transit Circle by Her Majesty's Astronomer E. J. Stone, and Assistants W. H. Finlay, G. W. H. Maclear, R. J. Pett, and I. Freeman.

"The season was generally most unfavorable at the cape for astronomical observation. The observations of Mars are not corrected for defective illumination nor for parallax, but all the other corrections to obtain the apparent north polar distance on the meridian have been applied. The latitude used has been 33° 56′ 3″.2 south. Bessel's refractions have been employed."

The observations of Mars were made, not by the method recommended in the circular, but in the usual way, with a single thread and only one bisection for each limb. Two bisections were generally made of each star.

The days on which Mars, with four or more comparison stars, was observed are given in the table below, together with the number of stars:

Table IV.

Day.	Stars.	Day.	Stars.	Day.	Stars.	Day.	Stars.
1877.		1877.		1877.		1877.	
Aug. 1	6	Aug. 20	6	Sept. 11	8	Sept. 26	5
2	7	29	6	12	8	27	5
3	6	30	7	13	7	28	6
7	6	31	7	15	5	29	6
9	7	Sept. 1	7	18	7	Oct. 1	5
13	6	3	5	19	6	3	5
14	5	4	7	20	7	4	5
15	5	6	7	24	6	5	6
18	6	10	4	25	6	6	6

SYDNEY.

The observations at Sydney were made with the Simms' Transit Circle by Government Astronomer H. C. Russell and Assistant H. A. Lenehan, and according to the method proposed in the circular. They also made a separate observation of Mars by bisecting "with the wire used for the nadir observation, at the reading zero, before the planet came on to the transit wires." These extra observations differed so widely from the others that they have not been used.

The errors of division on the circle were not known, but "all other known corrections, save for parallax in the case of Mars," were applied in deriving the apparent north polar distance of Mars and comparison stars.

The days on which Mars, with four or more comparison stars, was observed are given in the table below, together with the number of stars:

TABLE V.

Day.	Stars.	Day.	Stars.	Day.	Stars.	Day.	Stars.
1877		1877.		1877.		1877.	
July 29	5	Aug. 19	8	Sept. 3	4	Sept. 29	5
31	8	20	7	4	5	30	5
Aug. 2	7	22	8	6	5	Oct. 13	4
3	8	23	7	12	7	15	4
4	7	24	8	14	7	16	4
6	7	25	8	18	4	22	4
8	7	31	4	24	7	23	4
10	8	Sept. 2	5	28	4	24	6
11	7						

LEYDEN.

The observations at Leyden were made with the Transit Circle by Assistants E. F. v. d. Sande Bakhuyzen and Dr. J. C. Kapteyn.

"At the observation of Mars the telescope was moved by one of the assistants till the two segments under and above the two parallel horizontal wires were equal, and then both circles were read by the other assistant. In order to eliminate as far as possible the personal error in pointing on the planet at each transit, two pointings were made, one with the ordinary eye-piece, the other with a total reflection prism put between the eye-piece and the eye to invert the image of the planet. The declinations given are the mean of these two pointings or the mean of four circle readings, two on circle A and two on circle B. Only the four determinations on July 20, 21, 23, and 30 rest on one pointing with or without prism."

In observing the stars the suggestions in the circular were followed, and, though the prism was not used, both circles were read. All the known instrumental corrections were applied to the observations of Mars and the stars.

The days on which Mars, with four or more comparison stars, was observed are given in the table below, together with the number of stars:

TABLE VI.

Day.	Stars.	Day.	Stars.	Day.	Stars.	Day.	Stars.
1877.		1877.		1877.		1877.	
July 20	7	Aug. 17	8	Sept. 9	8	Oct. 2	8
21	7	21	6	11	8	3	8
23	7	22	7	12	7	4	8
30	8	30	4	17	4	5	8
Aug. 4	8	31	6	21	8	6	8
5	7	Sept. 1	5	25	8	9	5
6	8	2	8	27	8	14	7
8	8	4	6	29	7	15	8
15	8	8	8	30	7	20	8

CAMBRIDGE.

The observations at Cambridge were made with the Transit Circle by Prof. W. A. ROGERS. With this instrument the observations in declination were effected by means of transits over a group of two parallel threads inclined at an angle of about 6° to the horizontal. When the object entered the field, the telescope was properly set by the observer, and the transits over the inclined threads observed while the assistant read the four microscopes. After the object passed the vertical transit threads the telescope was moved until the object would again cross the inclined threads, when another set of transits for declination was observed and the four microscopes were read. The mean of the two determinations, when reduced to the meridian, was adopted.

All known instrumental corrections were applied in deducing the adopted apparent north polar distance of Mars and comparison stars.

The days on which Mars and four or more comparison stars was observed are given in the table below, together with the number of stars:

TABLE VII.

Day.	Stars.	Day.	Stars.	Day.	Stars.	Day.	Stars.
1877. Aug. 16	7	1877. Sept. 11	8	1877. Sept. 23	7	1877. Oct. 7	6
22	7	12	7	24	7	13	6
27	4	16	8	25	7	17	5
28	8	18	6	30	7	18	7
30	8	22	6	Oct. 1	7	23	8

COMBINATION OF THE RESULTS OF THE OBSERVATIONS.

One of the principal advantages of the method of determining the value of the solar parallax by meridian observations of a planet at opposition, and of comparison stars, lies in the fact that, except for obtaining the motion of the planet for the interval between the meridians of the different observing-stations, the positions of the planet and the stars need be known only approximately.

In combining the results of the observations, it has been decided to employ only those observations of Mars which were made when at least *four* comparison stars were observed, for the reason that, when less than one-half of the stars were observed, it was highly probable that the failure arose from cloudiness or from carelessness on the part of the observer. In either case the quality of the observations of both Mars and the stars would be vitiated.

In order to eliminate the errors in the positions of the stars, only those were used that were observed at both stations on the same night.

All of the observations have been reduced to the meridian of Washington, the positions of the stars have been corrected for the change in apparent place for the interval between the meridians, and the observed places of Mars have been corrected for motion during the same interval

The following table gives the local dates of the observations, the north polar distances of the stars used in the computations, and the mean of the north polar distances of the stars used:

Table VIII.

WASHINGTON AND MELBOURNE.

Washington—First Series.

Object.	July 29.	July 30.	August 6.	August 21.	August 27.	August 28.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 54.14	54.12	53.21	51.55	52.51	51.63
h^1 Aquarii	98 21 7.98	7.70	6.84	4.67	4.45	5.11
Weisse 76 . . .	100 13 59.96	59.38	59.02	56.20	57.49	57.12
ψ^2 Aquarii	99 50 53.96	54.66	53.32	50.90	51.44	51.16
B. A. C. 8239 . .	102 21 24.03	24.49	23.44	20.77	22.37	21.78
B. A. C. 8266 . .	102 35 7.23	6.26	6.45	4.30	4.70	4.72
B. A. C. 8285 . .	100 39 17.42	16.18	16.04	13.30	14.38	13.87
Weisse 985 . . .	103 49 42.72	42.73	41.87	40.05	40.76	40.38
Mean . . .	101 15 55.93	101 15 55.69	101 15 55.02	101 15 52.72	101 15 53.51	101 15 53.22

Second Series.

Object.	September 1.	September 15.
	° ′ ″	° ′ ″
64 Aquarii	100 39 41.36	41.75
70 Aquarii	101 11 55.69	55.71
74 Aquarii	102 15 51.08	51.56
B. A. C. 8004	103 43 24.55	25.53
Weisse 394	103 35 57.64	. .
B. A. C. 8199	102 12 58.48	. .
B. A. C. 8221	103 44 5.29	. .
B. A. C. 8266	102 35 3.79	. .
Mean	102 29 52.24	101 57 43.64

TABLE VIII—Continued.

Third Series.

Object.	September 21.	September 24.	September 26.	October 1.	October 2.	October 6.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 48.13	48.25	49.19	48.69	48.31	48.91
σ Aquarii	101 18 4.09	3.14	4.16	4.60	3.96	4.19
64 Aquarii	100 39 42.46	40.43	40.96	41.29	41.53	41.03
70 Aquarii	101 11 55.31	54.71	55.45	55.37	55.26	. .
Weisse 1241 . . .	100 15 40.28	. .	42.62	41.73	42.43	42.28
Weisse 76 . . .	100 13 55.74	55.31	55.95	55.77	56.02	56.48
ψ^3 Aquarii	99 50 49.69	50.29	0.49	50.62	50.28	50.55
97 Aquarii	105 42 26.86	28.43	28.05	27.33	28.06	29.49
Mean	101 40 10.32	101 52 14.37	101 40 10.86	101 40 10.68	101 40 10.73	101 44 13.28

Object.	October 9.	October 12.	October 14.	October 15.	October 17.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	. .	49.09	49.79	51.11	49.60
σ Aquarii	. .	4.67	4.96	5.67	4.78
64 Aquarii	40.50	41.51	42.29	41.40	42.51
70 Aquarii	54.81	55.85	56.57	56.94	. .
Weisse 1241.	42.04	42.28	43.22	43.46	42.64
Weisse 76	55.87	56.27	. .	56.87	. .
ψ^3 Aquarii	. .	50.22	50.34	51.46	50.28
97 Aquarii	. .	29.83	28.35	28.85	. .
Mean	100 35 18.30	101 40 11.22	101 52 30.79	101 40 11.97	101 14 37.96

WASHINGTON AND MELBOURNE.

Melbourne—First Series.

Object.	July 29.	July 30.	August 7.	August 21.	August 27.	August 28.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 52.72	52.56	51.95	50.97	47.12	49.31
h^1 Aquarii	98 21 6.60	5.93	5.27	3.39	3.59	3.38
Weisse 76 . . .	100 13 58.62	58.28	58.06	54.93	56.64	55.00
ψ^3 Aquarii	99 50 52.66	52.29	52.05	49.89	49.18	49.71
B. A. C. 8239. . .	102 21 22.82	22.64	22.30	19.89	20.13	19.91
B. A. C. 8266. . .	102 35 5.50	4.80	4.15	3.29	2.69	2.72
B. A. C. 8285. . .	100 39 15.40	14.44	14.13	12.71	10.51	12.24
Weisse 985 . . .	103 49 41.10	40.37	39.20	37.92	38.00	39.12
Mean . . .	101 15 54.43	101 15 53.91	101 15 53.39	101 15 51.62	101 15 50.98	104 15 51.42

TABLE VIII—Continued.

Second Series.

Object.	September 2.	September 16.
	° ′ ″	° ′ ″
64 Aquarii	100 39 39.93	41.05
70 Aquarii	101 11 54.64	54.43
74 Aquarii	102 15 49.89	49.61
B. A. C. 8004	103 43 23.28	24.85
Weisse 394	103 35 55.56	. .
B. A. C. 8199	102 12 56.86	. .
B. A. C. 8221	103 44 4.61	. .
B. A. C. 8266	102 35 1.85	. .
Mean	102 29 50.83	101 57 42.48

Third Series.

Object.	September 22.	September 25.	September 27.	October 2.	October 3.	October 7.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 47.07	47.54	47.98	47.64	49.57	48.24
σ Aquarii	101 18 2.65	3.70	4.17	3.62	4.52	3.95
64 Aquarii	100 39 40.34	40.50	40.19	40.48	41.20	40.86
70 Aquarii	101 11 53.78	54.51	55.43	55.41	56.17	. .
Weisse 1241 . . .	100 15 40.56	. .	41.95	41.70	42.39	41.27
Weisse 76 . . .	100 13 54.77	55.33	56.34	55.14	56.06	55.86
ψ^3 Aquarii	99 50 49.08	48.98	49.60	49.20	50.25	50.07
97 Aquarii	105 42 26.09	26.78	27.91	27.14	28.22	26.84
Mean . . .	101 40 9.29	101 52 13.91	101 40 10.45	101 40 10.04	101 40 11.05	101 44 12.44

Object.	October 10.	October 12.	October 15.	October 16.	October 18.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	. .	48.04	49.00	49.03	48.16
σ Aquarii	. .	4.39	5.62	4.06	5.24
64 Aquarii	41.66	41.04	42.22	40.75	41.99
70 Aquarii	55.70	54.78	56.48	56.02	. .
Weisse 1241	43.51	41.86	42.66	42.42	42.66
Weisse 76	55.27	54.69	. .	55.98	. .
ψ^3 Aquarii	. .	49.34	50.33	48.98	50.24
97 Aquarii	. .	27.91	28.23	27.49	. .
Mean	100 35 19.04	101 40 10.26	101 52 30.65	101 40 10.59	101 14 37.66

TABLE VIII—Continued.

WASHINGTON AND SYDNEY.

Washington—First Series.

Object.	July 29.	July 30.	August 6.	August 18.	August 21.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 . .	54.12	53.21	. .	51.55
h^1 Aquarii	98 21 7.98	7.70	6.84	. .	4.67
Weisse 76	100 13 59.96	59.38	59.02	57.33	56.20
ψ^2 Aquarii	99 50 53.96	54.66	53.32	51.27	50.90
B. A. C. 8239	102 21 24.03	24.49	23.44	20.56	20.77
B. A. C. 8266	102 35 . .	6.26	6.45	3.12	4.30
B. A. C. 8285	100 39 . .	16.18	. .	13.60	13.30
Weisse 985	103 49 42.72	42.73	41.87	40.05	40.05
Mean	100 55 25.73	101 15 55.69	101 21 9.16	101 35 0.99	101 15 52.72

Second Series.

Object.	September 1.	September 3.
	° ′ ″	° ′ ″
64 Aquarii	100 39 . .	. .
70 Aquarii	101 11 55.69	. .
74 Aquarii	102 15 51.08	. .
B. A. C. 8004	103 43 24.55	24.64
Weisse 394	103 35 . .	56.88
B. A. C. 8199	102 12 58.48	58.17
B. A. C. 8221	103 44 . .	5.41
B. A. C. 8266	102 35 3.79	3.09
Mean	102 23 50.72	103 10 17.64

Third Series.

Object.	September 24.	October 12.	October 14.	October 15.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 . .	. .	49.79	51.11
σ Aquarii	101 18 3.14	. .	4.96	5.67
64 Aquarii	100 39 40.43	. .	42.29	41.40
70 Aquarii	101 11 54.71	. .	56.57	56.94
Weisse 1241	100 15 42.38	42.28	. .	. .
Weisse 76	100 13 55.31	56.27	. .	. .
ψ^2 Aquarii	99 50 50.29	50.22	. .	. .
97 Aquarii	105 42 28.43	29.83	. .	. .
Mean	101 18 56.38	101 30 44.65	101 49 38.40	101 49 38.78

TABLE VIII—Continued.

WASHINGTON AND SYDNEY.

Sydney—First Series.

Object.	July 29.	July 31.	August 6.	August 19.	August 22.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 . .	53.33	50.57	. .	49.96
h^1 Aquarii	98 21 3.05	6.98	4.75	. .	2.90
Weisse 76	100 13 55.58	57.83	57.20	57.34	55.63
ψ^2 Aquarii	99 50 51.61	51.74	52.24	52.10	50.43
B. A. C. 8239	102 21 20.70	23.43	21.75	21.55	20.95
B. A. C. 8266	102 35 . .	5.38	4.65	2.97	2.27
B. A. C. 8285	100 39 . .	16.34	. .	13.23	13.56
Weisse 985	103 49 38.98	41.89	40.67	40.26	40.47
Mean	100 55 21.98	101 15 54.62	101 21 7.40	101 35 1.24	101 15 52.02

Second Series.

Object.	September 2.	September 4.
	° ′ ″	° ′ ″
64 Aquarii	100 39 . .	. .
70 Aquarii	101 11 55.56	. .
74 Aquarii	102 15 51.66	. .
B. A. C. 8004	103 43 24.65	23.92
Weisse 394	103 35 . .	57.59
B. A. C. 8199	102 12 57.59	58.71
B. A. C. 8221	103 44 . .	5.21
B. A. C. 8226	102 35 2.97	2.90
Mean	102 23 50.49	103 10 17.67

Third Series.

Object.	September 24.	October 13.	October 15.	October 16.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 . .	. .	50.12	50.91
σ Aquarii	101 18 3.84	. .	5.74	6.10
64 Aquarii	100 39 40.77	. .	44.92	44.46
70 Aquarii	101 11 54.52	. .	57.92	59.98
Weisse 1241	100 15 41.35	44.24	. .	. .
Weisse 76	100 13 56.14	57.40	. .	. .
ψ^2 Aquarii	99 50 50.59	51.90	. .	. .
97 Aquarii	105 42 28.55	30.78	. .	. .
Mean	101 18 56.54	101 30 46.08	101 49 39.68	101 49 40.36

TABLE VIII—Continued.

WASHINGTON AND CAPE OF GOOD HOPE.

Washington—First Series.

Object.	August 6.	August 18.
	° ′ ″	° ′ ″
74 Aquarii	102 15 53.21	51.21
h^1 Aquarii	98 21 6.84	4.24
Weisse 76	100 13 59.02	57.33
ψ^3 Aquarii	99 50 53.32	. .
B. A. C. 8239	102 21 23.44	20.56
B. A. C. 8266	102 35 . .	. .
B. A. C. 8285	100 39 . .	13.60
Weisse 985	103 49 41.87	40.05
Mean	101 8 49.62	101 16 51.16

Second Series.

Object.	September 1.	September 3.
	° ′ ″	° ′ ″
64 Aquarii	100 39 41.36	40.55
70 Aquarii	101 11 55.69	54.92
74 Aquarii	102 15 51.08	50.42
B. A. C. 8004	103 43 24.55	24.64
Weisse 394	103 35 57.64	. .
B. A. C. 8199	102 12 58.48	. .
B. A. C. 8221	103 44 . .	. .
B. A. C. 8266	102 35 3.79	3.09
Mean	102 19 16.08	102 5 10.72

Third Series.

Object.	September 24.	September 26.	October 1.	October 2.	October 6.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 48.25	49.19	48.69	48.31	48.91
σ Aquarii	101 18 . .	. .	. .	. .	. .
64 Aquarii	100 39 40.43	40.96	41.29	41.53	41.03
70 Aquarii	101 11 54.71	55.45	55.37	55.26	. .
Weisse 1241.	100 15 42.38	. .	41.73	42.43	42.28
Weisse 76	100 13 55.31	55.95	55.77	56.02	56.48
ψ^3 Aquarii	99 50 . .	. .	. .	. .	. .
97 Aquarii	105 42 28.43	28.05	. .	. .	29.49
Mean	102 2 4.92	102 23 21.92	101 18 0.57	101 18 0.71	102 12 7.64

TABLE VIII—Continued.

WASHINGTON AND CAPE OF GOOD HOPE.

Cape of Good Hope—First Series.

Object.	August 7.	August 18.
	° ′ ″	° ′ ″
74 Aquarii	102 15 52.78	52.67
h^1 Aquarii	98 21 5.14	5.83
Weisse 76	100 13 58.14	57.73
ψ^3 Aquarii	99 50 51.95	. .
B. A. C. 8239	102 21 21.61	22.60
B. A. C. 8266	102 35 . .	. .
B. A. C. 8285	100 39 . .	15.19
Weisse 985	103 49 41.89	41.89
Mean	101 8 48.58	101 16 52.65

Second Series.

Object.	September 1.	September 3.
	° ′ ″	° ′ ″
64 Aquarii	100 39 42.27	42.47
70 Aquarii	101 11 56.52	55.93
74 Aquarii	102 15 51.48	51.55
B. A. C. 8004	103 43 26.70	25.29
Weisse 394	103 35 57.63	. .
B. A. C. 8199	102 12 58.92	. .
B. A. C. 8221	103 44 . .	. .
B. A. C. 8266	102 35 3.21	3.63
Mean	102 19 16.68	102 5 11.77

Third Series.

Object.	September 24.	September 26.	October 1.	October 3.	October 6.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 50.23	50.46	50.33	49.53	50.08
σ Aquarii	101 18 . .	. .	. .	. .	. .
64 Aquarii	100 39 42.96	42.37	41.07	40.94	41.18
70 Aquarii	101 11 55.46	56.70	55.48	54.09	. .
Weisse 1241	100 15 42.36	. .	42.18	41.60	42.34
Weisse 76	100 13 57.88	56.69	56.43	56.52	55.91
ψ^3 Aquarii	99 50 . .	. .	. .	. .	. .
97 Aquarii	105 42 29.03	28.00	. .	. .	29.20
Mean	102 2 6.32	102 23 22.84	101 18 1.10	101 18 0.54	102 12 7.74

TABLE VIII—Continued.

MELBOURNE AND LEYDEN.

Melbourne—First Series.

Object.	July 21.	July 22.	July 23.	July 30.	August 7.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 . .	53.05	52.79	52.56	51.95
h^1 Aquarii	98 21 7.37	7.54	7.25	5.93	5.27
Weisse 76	100 13 . .	59.01	59.14	58.28	58.06
ψ^2 Aquarii	99 50 53.05	53.03	53.46	52.29	52.05
B. A. C. 8239	102 21 23.67	23.59	23.40	22.64	22.30
B. A. C. 8266	102 35 5.59	5.88	5.62	4.80	4.15
B. A. C. 8285	100 39 16.15	16.07	16.12	14.44	14.13
Weisse 985	103 49 . .	. .	. .	40.37	39.20
Mean	100 45 33.17	100 53 56.88	100 53 56.83	100 15 53.91	101 15 53.39

Object.	August 8.	August 15.	August 17.	August 21.	August 23.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	51.72	. .	50.10	. .	. .
h^1 Aquarii	5.30	. .	4.22	. .	. .
Weisse 76	56.45	55.61	56.13	54.93	. .
ψ^2 Aquarii	50.92	50.46	49.83	49.89	. .
B. A. C. 8239	22.03	21.01	19.51	19.89	19.60
B. A. C. 8266	3.44	3.15	2.72	3.29	2.17
B. A. C. 8285	14.00	12.89	12.20	12.71	12.14
Weisse 985	40.34	39.44	37.72	37.92	38.16
Mean	101 15 53.02	101 35 0.43	101 15 51.55	101 34 59.77	102 21 18.02

Second Series.

Object.	August 30.	September 1.	September 2.	September 5.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
64 Aquarii	100 39 . .	41.44	39.93	. .
70 Aquarii	101 11 . .	55.57	54.64	53.79
74 Aquarii	102 15 49.58	49.75	49.89	49.30
B. A. C. 8004	103 43 . .	24.39	23.28	22.43
Weisse 394	103 35 . .	55.95	55.56	55.08
B. A. C. 8199	102 12 56.08	. .	56.86	55.70
B. A. C. 8221	103 44 4.81	. .	4.61	3.96
B. A. C. 8266	102 35 2.06	. .	1.85	. .
Mean	102 41 58.13	102 17 21.42	102 29 50.83	102 47 20.04

TABLE VIII—Continued.

Third Series.

Object.	Sept. 17.	Sept. 22.	Sept. 25.	Sept. 27.	October 2.	October 3.	October 4.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii . .	104 8 . .	47.07	47.54	47.98	47.64	49.57	48.21
σ Aquarii . .	101 18 4.00	2.65	3.70	4.17	3.62	4.52	4.30
64 Aquarii . .	100 39 . .	40.34	40.50	40.19	40.48	41.20	39.96
70 Aquarii . .	101 11 . .	53.78	54.51	55.43	55.41	56.17	54.24
Weisse 1241 .	100 15 . .	40.56	. .	41.95	41.70	42.39	40.64
Weisse 76 .	100 13 54.20	54.77	55.33	56.34	55.14	56.06	54.82
ψ² Aquarii . .	99 50 48.78	49.08	48.98	49.60	49.20	50.25	49.62
97 Aquarii . .	105 42 26.56	26.09	26.78	27 91	27.14	28 22	26.91
Mean . . .	101 46 18.38	101 40 9.29	101 52 13.91	101 40 10.45	101 40 10.04	101 40 11.05	101 40 9.84

Object.	October 5.	October 7.	October 9.	October 14.	October 15.	October 21.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	49.33	48.24	48.95	. .	49.00	. .
σ Aquarii	4.50	3.95	4.24	4.79	5.62	5.92
64 Aquarii	41.51	40.86	40.55	40.52	42.22	42.33
70 Aquarii	55.93	55.39	55.41	55.75	56.48	56.46
Weisse 1241 . .	41.60	41.27	41.90	41.87	42.66	43.59
Weisse 76 . . .	55.08	55.86	56.28	55.62	. .	57.27
ψ² Aquarii	48.81	50.07	49.89	49.33	50.33	51.21
97 Aquarii	26.93	26.84	. .	28.17	28.23	. .
Mean	101 40 10.46	101 40 10.31	101 5 33.89	101 18 56.58	101 52 30.65	100 35 2.80

MELBOURNE AND LEYDEN.

Leyden—First Series.

Object.	July 20.	July 21.	July 23.	July 30.	August 6.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	102 15 . .	53.28	53.14	53.21	51.77
h^1 Aquarii	98 21 7.60	7.90	7.72	6.56	5.78
Weisse 76	100 13 . .	60.05	60.14	59.31	57.77
ψ² Aquarii	99 50 53.10	53.86	52.83	51.94	51.85
B. A. C. 8239	102 21 23.80	23.75	23.59	22.88	21.88
B. A. C. 8266	102 35 6.95	6.86	6.08	5.13	5.08
B. A. C. 8285	100 39 17.54	16.59	16.46	15.98	14.74
Weisse 985	103 49 . .	. .	. .	41.92	41.03
Mean	100 45 33.80	100 53 57.47	100 53 57.14	101 15 54.62	101 15 53.74

Table VIII—Continued.

MELBOURNE AND LEYDEN.

Leyden—First Series.

Object.	August 8.	August 15.	August 17.	August 21.	August 22.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
74 Aquarii	51.35	. .	51.65	. .	. .
h^1 Aquarii	5.83	. .	4.84	. .	. .
Weisse 76	57.81	57.70	57.00	56.53	. .
ψ^2 Aquarii	51.85	51.01	50.88	50.55	. .
B. A. C. 8239	21.65	20.80	20.68	20.13	20.72
B. A. C. 8266	4.43	4.11	3.46	3.79	2.83
B. A. C. 8285	14.58	14.30	13.64	13.52	13.62
Weisse 985	40.58	40.52	40.87	40.47	39.94
Mean	101 15 53.51	101 35 1.41	101 15 52.88	101 35 0.83	102 21 19.28

Second Series.

Object.	August 30.	September 1.	September 2.	September 4.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″
64 Aquarii	100 39 . .	41.89	40.94	. .
70 Aquarii	101 11 . .	55.08	55 78	57.97
74 Aquarii	102 15 50.96	50.80	50.88	48.28
B. A. C. 8004	103 43 . .	24.57	25.11	24.55
Weisse 394	103 35 . .	56.50	56.49	56.16
B. A. C. 8199	102 12 58.67	. .	57.79	57.80
B. A. C. 8221	103 44 5.92	. .	6.63	6.18
B. A. C. 8266	102 35 2.84	. .	2.07	. .
Mean	102 41 59.60	102 17 21.77	102 29 51.96	102 47 21.82

Third Series.

Object.	Sept. 17.	Sept. 21.	Sept. 25.	Sept. 27.	October 2.	October 3.	October 4.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	104 8 . .	48.50	49.23	49.03	49.23	48.50	49.69
σ Aquarii	101 18 5.07	4.89	5.15	4.17	55.54	4.82	5.35
64 Aquarii	100 39 . .	41.66	41.94	41.30	41.55	41.63	41.16
70 Aquarii	101 11 . .	55.27	55.27	55.39	55.04	55.84	55.49
Weisse 1241	100 15 . .	42.66	. .	42.94	41.77	42.50	42.45
Weisse 76	100 13 55.72	56.13	56.66	56.67	55.29	56.00	56.28
ψ^2 Aquarii	99 50 49.88	49.68	50.01	50.03	50.42	50.38	50.33
97 Aquarii	105 42 26.87	27.22	27.41	28.12	29.36	28.99	28.44
Mean	101 46 19.38	101 40 10.75	101 52 15.10	101 40 10.96	101 40 11.02	101 40 11.08	101 40 11.15

TABLE VIII—Continued.

Third Series.

Object.	October 5.	October 6.	October 9.	October 14.	October 15.	October 20.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii	49.74	49.61	48.98	. .	50.08	. .
σ Aquarii	5.19	5.49	5.20	5.98	4.98	5.79
64 Aquarii	42.20	41.87	42.46	41.61	42.33	41.83
70 Aquarii	55.70	56.29	57.14	55.86	56.96	56.33
Weisse 1241 . . .	42.42	42.47	42.01	43.25	42.88	43.56
Weisse 76 . . .	56.27	56.24	56.18	56.46	. .	57.77
ψ^2 Aquarii	50.21	50.32	50.23	50.80	50.52	50.92
97 Aquarii	28.10	28 20	. .	29.16	28.82	. .
Mean	101 40 11.23	101 40 11.31	101 5 34.60	101 18 57.59	101 52 30.94	100 35 2.70

MELBOURNE AND CAMBRIDGE.

Melbourne—First Series.

Object.	August 28.
	° ′ ″
74 Aquarii	102 15 49.31
h^1 Aquarii	98 21 3.38
Weisse 76	100 13 55.00
ψ^2 Aquarii	99 50 49.71
B. A. C. 8239	102 21 19.91
B. A. C. 8266	102 35 2.72
B. A. C. 8285	100 39 12.24
Weisse 985	103 49 . .
Mean	100 53 53.18

Second Series.

Object.	August 30.	September 16.
	° ′ ″	° ′ ″
64 Aquarii	100 39 39.64	41.05
70 Aquarii	101 11 55.50	54.43
74 Aquarii	102 15 49.58	49.61
B. A. C. 8004	103 43 22.92	24.85
Weisse 394	103 35 54.87	. .
B. A. C. 8199	102 12 56.08	. .
B. A. C. 8221	103 44 4.81	5.43
B. A. C. 8266	102 35 2.06	3.81
Mean	102 29 50.68	102 21 39.76

TABLE VIII—Continued.

Third Series.

Object.	September 22.	September 24.	September 25.	October 1.	October 2.	October 7.	October 14.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii . .	104 8 47.07	. .	47.54	. .	47.64	48.24	48.72
σ Aquarii . .	101 18 2.65	4.38	3.70	. .	3.62	. .	4.79
64 Aquarii . .	100 39 40.34	40.49	40.50	40.83	40.48	40.86	40.52
70 Aquarii . .	101 11 53.78	55.00	54.51	55.78	55.41	55.39	55.75
Weisse 1241 .	100 15 . .	41.57	. .	. .	. .	. .	. .
Weisse 76 .	100 13 54 77	55.27	55.33	. .	55.14	55.86	55.62
ψ² Aquarii . .	99 50 49.08	48.93	48.98	49.87	49.20	50.07	. .
97 Aquarii . .	105 42 . .	27.42	26.78	27.64	27.14	26.84	28.17
Mean . .	101 13 51.28	101 18 56.15	101 52 13.91	101 51 13.53	101 52 14.09	101 57 56.21	102 12 28.93

MELBOURNE AND CAMBRIDGE.

Cambridge—First Series.

Object.	August 28.
	° ′ ″
74 Aquarii	102 15 50.68
h¹ Aquarii	98 21 4.77
Weisse 76	100 13 56.42
ψ³ Aquarii	99 50 50.17
B. A. C. 8239	102 21 21.52
B. A. C. 8266	102 35 4.34
B. A. C. 8285	100 39 14.27
Weisse 985	103 49 . .
Mean	100 53 54.60

Second Series.

Object.	August 30.	September 16.
	° ′ ″	° ′ ″
64 Aquarii	100 39 40.37	40.86
70 Aquarii	101 11 54.97	54.80
74 Aquarii	102 15 50.58	50.82
B. A. C. 8004	103 43 23.03	25.18
Weisse 394	103 35 55.88	55.81
B. A. C. 8199	102 12 56.90	57.55
B. A. C. 8221	103 44 5.54	5.94
B. A. C. 8266	102 35 2.63	3.01
Mean	102 29 51.24	102 21 40.10

TABLE VIII—Continued.

MELBOURNE AND CAMBRIDGE.

Third Series.

Object.	September 22.	September 23.	September 24.	September 30.	October 1.	October 7.	October 13.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
50 Aquarii . .	104 8 45.88	. .	48.58	. .	49.09	49.20	49.99
σ Aquarii . .	101 18 3.29	4.29	4.37	. .	4.93	. .	4.78
64 Aquarii . .	100 39 40.83	41.37	41.40	42.26	40.29	42.31	41.93
70 Aquarii . .	101 11 56.25	55.37	54.86	55.51	55.85	55.71	55.99
Weisse 1241 .	100 15 . .	42.82	. .	. .	. .	. .	. .
Weisse 76 .	100 13 55.82	55.37	56.40	. .	58.84	56.46	55.90
ψ^2 Aquarii . .	99 50 49.36	49.64	51.04	49.86	50.08	49.78	. .
97 Aquarii . .	105 42 . .	28.04	27.22	27.65	28.14	28.30	28.07
Mean . .	101 13 51.90	101 18 56.70	101 52 14.39	101 51 13.82	101 52 14.74	101 57 56.96	102 12 29.44

The following table shows the mean, taken from Table VIII, of the north polar distances of all the stars observed each night at both stations, corrected for the change in apparent place for the interval between Washington and the observing-station. It also shows the correction C, to be applied to all observations on each night at the second station:

TABLE IX.

Washington and Melbourne.

Date.	First Station.	Second Station.	C.	Date.	First Station.	Second Station.	C.
	Washington.	Melbourne.			Washington.	Melbourne.	
1877.	° ′ ″	″	″	1877.	° ′ ″	″	″
July 29	101 15 55.93	54.50	+ 1.43	Sept. 26	101 40 10.86	10.46	+ 0.40
30	101 15 55.69	53.98	+ 1.71	Oct. 1	101 40 10.68	10.06	+ 0.62
Aug. 6	101 15 55.02	53.35	+ 1.67	2	101 40 10.73	11.07	— 0.34
21	101 15 52.72	51.66	+ 1.06	6	101 44 13.28	12.46	+ 0.82
27	101 15 53.51	51.00	+ 2.51	9	100 35 18.30	19.06	— 0.76
28	101 15 53.22	51.44	+ 1.78	12	101 40 11.22	10.23	+ 0.99
Sept. 1	102 29 52.24	50.82	+ 1.42	14	101 52 30.79	30.67	+ 0.12
15	101 57 43.64	42.48	+ 1.16	15	101 40 11.97	10.61	+ 1.36
21	101 40 10.32	9.30	+ 1.02	17	101 14 37.96	37.68	+ 0.28
24	101 52 14.37	13.92	+ 0.45				

Washington and Sydney.

	Washington.	Sydney.	C.		Washington.	Sydney.	C.
July 29	100 55 25.73	22.05	+ 3.68	Sept. 3	103 10 17.64	17.66	— 0.02
30	101 15 55.69	54.58	+ 1.11	24	101 18 56.38	56.52	— 0.14
Aug. 6	101 21 9.16	7.46	+ 1.70	Oct. 12	101 30 44.65	46.10	— 1.45
18	101 35 0.99	1.21	— 0.22	14	101 49 38.40	39.70	— 1.30
21	101 15 52.72	52.00	+ 0.72	15	101 49 38.78	40.38	— 1.60
Sept. 1	102 23 50.72	50.48	+ 0.24				

TABLE IX—Continued.

Washington and Cape of Good Hope.

Date.	First Station.	Second Station.	C.	Date.	First Station.	Second Station.	C.
	Washington.	C. G. Hope.			Washington.	C. G. Hope.	
1877.	° ′ ″	″	″	1877.	° ′ ″	″	″
Aug. 6	101 8 49.62	48.51	+ 1.11	Sept. 26	102 23 21.92	22.83	− 0.91
18	101 16 51.16	52.47	− 1.51	Oct. 1	101 18 0.57	1.09	− 0.52
Sept. 1	102 19 16.08	16.69	− 0.61	2	101 18 0.71	0.57	+ 0.14
3	102 5 10.72	11.78	− 1.06	6	102 12 7.64	7.73	− 0.09
24	102 2 4.92	6.31	− 1.39				

Melbourne and Leyden.

	Melbourne.	Leyden.	C.		Melbourne.	Leyden.	C.
July 20	100 45 33.12	33.83	− 0.71	Sept. 17	101 46 18.37	19.38	− 1.01
21	100 53 56.83	57.50	− 0.67	21	101 40 9.30	10.75	− 1.45
23	100 53 56.90	57.17	− 0.27	25	101 52 13.90	15.09	− 1.19
30	101 15 53.98	54.64	− 0.66	27	101 40 10.43	10.95	− 0.52
Aug. 6	101 15 53.35	53.76	− 0.41	Oct. 2	101 40 10.02	11.01	− 0.99
8	101 15 53.08	53.53	− 0.45	3	101 40 11.03	11.07	− 0.04
15	101 35 0.48	1.43	− 0.95	4	101 40 9.82	11.14	− 1.32
17	101 15 51.59	52.90	− 1.31	5	101 40 10.44	11.22	− 0.78
21	101 34 59.81	60.84	− 1.03	6	101 40 10.33	11.30	− 0.97
22	102 21 18.00	19.29	− 1.29	9	101 5 33.87	34.59	− 0.72
30	102 41 58.15	59.61	− 1.46	14	101 18 56.54	57.58	− 1.04
Sept. 1	102 17 21.43	21.78	− 0.35	15	101 52 30.61	30.93	− 0.32
2	102 29 50.84	51.96	− 1.12	20	100 35 2.82	2.69	+ 0.13
4	102 47 20.03	21.82	− 1.79				

Melbourne and Cambridge.

	Melbourne.	Cambridge.	C.		Melbourne.	Cambridge.	C.
Aug. 28	100 53 53.20	54.60	− 1.40	Sept. 24	101 52 13.92	14.39	− 0.47
30	102 29 50.70	51.24	− 0.54	30	101 51 13.54	13.82	− 0.28
Sept. 16	102 21 39.76	40.10	− 0.34	Oct. 1	101 52 14.11	14.74	− 0.63
22	101 13 51.26	51.90	− 0.64	7	101 57 56.19	56.96	− 0.77
23	101 18 56.16	56.70	− 0.54	13	102 12 28.95	29.44	− 0.49

COMPARISON OF THE OBSERVATIONS OF MARS.

The following table exhibits the comparison of the north polar distances of Mars as determined at a northern and a southern station. The *first* column gives the Washington date. The columns headed N. P. D. give the apparent north polar distance of Mars corrected for defective illumination. The columns headed *motion* give the corrections for motion of Mars for the interval between Washington and the observing station. The quantities in column C are taken directly from Table IX, and the quantities *p*, in the last column, are the differences in north polar distance due to the parallax of Mars.

TABLE X.

MARS.						
	WASHINGTON.		MELBOURNE.			
Date.	N. P. D.	Correction.	N. P. D.	Corrections.		W.—M. =*p*
		Motion.		Motion.	C	
1877.	° ′ ″	′ ″	° ′ ″	′ ″	″	″
July 29	99 45 26.27	. . .	99 44 44.74	+ 0 14.95	+ 1.43	25.15
30	99 46 3.47	. . .	99 45 12.31	+ 0 24.78	+ 1.71	24.67
Aug. 6	99 57 45.63	. . .	99 58 18.15	− 0 59.95	+ 1.67	25.76
21	100 58 16.94	. . .	100 54 42.60	+ 3 6.23	+ 1.06	27.05
27	101 29 24.88	. . .	101 25 41.77	+ 3 12.58	+ 2.51	28.02
28	101 34 35.83	. . .	101 30 54.03	+ 3 11.33	+ 1.78	28.69
Sept. 1	101 54 43.79	. . .	101 56 3.69	− 1 50.74	+ 1.42	29.42
15	102 43 17.19	. . .	102 43 25.20	− 0 36.35	+ 1.16	27.18
21	102 47 25.59	. . .	102 46 50.44	+ 0 7.57	+ 1.02	26.36
24	102 45 9.53	. . .	102 44 13.73	+ 0 29.87	+ 0.45	25.48
26	102 42 3.41	. . .	102 40 52.19	+ 0 44.60	+ 0.40	26.22
Oct. 1	102 28 43.07	. . .	102 26 57.29	+ 1 20.50	+ 0.62	24.66
2	102 25 6.37	. . .	102 23 14.94	+ 1 27.49	− 0.34	24.28
6	102 7 41.59	. . .	102 5 22.18	+ 1 54.95	+ 0.82	23.64
9	101 51 33.79	. . .	101 48 56.82	+ 2 14.32	− 0.76	23.41
12	101 32 57.69	. . .	101 36 35.27	− 4 0.87	+ 0.99	22.30
14	101 19 15.72	. . .	101 16 9.64	+ 2 44.26	+ 0.12	21.70
15	101 12 2.91	. . .	101 8 50.87	+ 2 49.86	+ 1.36	20.82
17	100 56 53.42	. . .	100 53 30.56	+ 3 0.48	+ 0.28	22.10
	WASHINGTON.		SYDNEY.			W.—S.
July 29	99 45 26.27	. . .	99 44 44.42	+ 0 15.29	+ 3.68	22.88
30	99 46 3.47	. . .	99 45 57.44	− 0 15.58	+ 1.11	20.50
Aug. 6	99 59 45.63	. . .	99 55 43.59	+ 1 34.44	+ 1.70	25.90
18	100 43 29.82	. . .	100 44 52.38	− 1 45.44	− 0.22	23.10
21	100 58 16.94	. . .	100 59 48.85	− 1 51.29	+ 0.72	26.66
Sept. 1	101 54 43.79	. . .	101 56 1.61	− 1 45.76	+ 0.24	27.70
3	102 4 9.36	. . .	102 5 22.24	− 1 39.63	− 0.02	26.77
24	102 45 9.53	. . .	102 45 28.11	− 0 43.18	− 0.14	24.74
Oct. 12	101 32 57.69	. . .	101 30 12.79	+ 2 25.73	− 1.45	20.62
14	101 19 15.72	. . .	101 16 21.83	+ 2 36.80	− 1.30	18.39
15	101 12 2.91	. . .	101 9 3.15	+ 2 42.14	− 1.60	19.22

TABLE X—Continued.

MARS.

	WASHINGTON.		CAPE OF GOOD HOPE.			
Date.	N. P. D.	Correction.	N. P. D.	Corrections.		W.—C. G. H. =p
		Motion.		Motion.	C	
1877.	° ′ ″	′ ″	° ′ ″	′ ″	″	″
Aug. 6	99 57 45.63	. . .	99 59 17.43	− 1 56.77	+ 1.11	23.86
18	100 43 29.82	. . .	100 41 48.70	+ 1 15.92	− 1.51	26.71
Sept. 1	101 54 43.79	. . .	101 52 57.62	+ 1 17.11	− 0.61	29.67
3	102 4 9.36	. . .	102 2 28.39	+ 1 13.03	− 1.06	29.00
24	102 45 9.53	. . .	102 45 5.22	− 0 19.02	− 1.39	24.72
26	102 42 3.41	. . .	102 42 9.02	− 0 29.23	− 0.91	24.53
Oct. 1	102 28 43.07	. . .	102 29 13.50	− 0 54.16	− 0.52	24.25
2	102 25 6.37	. . .	102 21 53.36	+ 2 50.04	+ 0.14	22.83
6	102 7 41.59	. . .	102 8 39.02	− 1 18.08	− 0.09	20.74
	MELBOURNE.		LEYDEN.			M:—L.
July 20	99 50 26.96	+ 0 40.80	99 51 58.23	− 0 25.13	− 0.71	24.63
21	99 48 51.54	+ 0 35.07	99 50 12.75	− 0 21.76	− 0.67	23.71
23	99 47 29.81	− 0 42.48	99 47 27.61	− 0 14.93	− 0.27	25.08
30	99 45 12.31	+ 0 24.78	99 45 54.48	+ 0 9.81	− 0.66	26.54
Aug. 6	99 58 18.15	− 0 59.95	99 57 13.10	+ 0 34.42	− 0.41	28.91
8	100 1 4.41	+ 1 49.65	100 2 42.69	+ 0 40.88	− 0.45	29.06
15	100 26 33.62	+ 2 40.71	100 28 45.14	+ 0 59.44	− 0.95	29.30
17	100 35 25.80	+ 2 51.33	100 37 45.94	+ 1 3.26	− 1.31	30.76
21	100 54 42.60	+ 3 6.23	100 57 13.56	+ 1 8.60	− 1.03	32.30
22	101 4 53.92	− 1 58.00	101 2 18.31	+ 1 9.50	− 1.29	30.60
30	101 41 11.21	+ 3 7.20	101 43 42.52	+ 1 8.56	− 1.46	31.21
Sept. 1	101 51 11.97	+ 3 0.32	101 53 39.25	+ 1 5.94	− 0.35	32.55
2	101 56 3.69	+ 2 55.86	101 58 27.30	+ 1 4.25	− 1.12	30.88
4	102 9 46.99	− 1 40.50	102 7 40.70	+ 1 0.11	− 1.79	32.53
17	102 44 46.21	+ 0 41.09	102 45 44.02	+ 0 14.26	− 1.01	29.97
21	102 46 50.44	+ 0 7.57	102 47 32.20	− 0 3.14	− 1.45	29.60
25	102 44 13.73	− 0 54.00	102 44 9.43	− 0 20.68	− 1.19	27.83
27	102 40 52.19	− 1 17.68	102 40 32.67	− 0 29.37	− 0.52	28.27
Oct. 2	102 26 57.29	− 2 15.17	102 25 59.77	− 0 50.45	− 0.99	26.21
3	102 23 14.94	− 2 26.39	102 22 9.42	− 0 54.56	− 0.04	26.27
4	102 19 12.53	− 2 37.52	102 18 1.46	− 0 58.64	− 1.32	26.49
5	102 14 54.34	− 2 48.58	102 13 35.10	− 1 2.70	− 0.78	25.86
6	102 5 22.18	+ 1 54.95	102 8 51.36	− 1 6.72	− 0.97	26.54
9	101 54 42.43	− 3 31.08	101 52 56.17	− 1 18.25	− 0.72	25.85
14	101 23 13.42	− 4 19.76	101 20 55.32	− 1 36.05	− 1.04	24.57
15	101 16 9.64	− 4 28.88	101 13 44.63	− 1 39.16	− 0.32	24.39
20	100 28 51.63	+ 3 15.38	100 34 24.98	− 1 54.61	+ 0.13	23.49

TABLE X—Continued.

MARS.

Date.	MELBOURNE.		CAMBRIDGE.			M.—C. $=p$
	N. P. D.	Correction. Motion.	N. P. D.	Corrections. Motion.	C	
1877.	° ′ ″	′ ″	° ′ ″	′ ″	″	″
Aug. 28	101 30 54.03	+ 3 11.33	101 34 31.85	+ 0 5.09	− 1.40	30.18
30	101 41 11.21	+ 3 7.20	101 44 44.47	+ 0 4.97	− 0.54	30.49
Sept. 16	102 43 25.20	+ 0 52.72	102 44 45.71	+ 0 1.31	− 0.34	28.76
22	102 46 50.44	− 0 18.15	102 47 2.00	− 0 0.58	− 0.64	28.49
23	102 45 25.80	+ 0 22.45	102 46 17.39	− 0 0.90	− 0.54	27.70
24	102 44 13.73	+ 0 29.87	102 45 11.70	− 0 1.22	− 0.47	26.41
30	102 30 21.08	+ 1 13.46	102 32 3.59	− 0 3.09	− 0.28	25.68
Oct. 1	102 26 57.29	+ 1 20.50	102 28 47.63	− 0 3.40	− 0.63	25.81
7	102 5 22.18	− 3 10.33	102 2 42.60	− 0 5.16	− 0.77	24.82
13	101 23 13.42	+ 2 38.56	101 26 22.56	− 0 6.76	− 0.49	23.33

The corrections for the motion of Mars, given in the above table, have been derived from the positions of the planet found in the American Ephemeris for 1877.

From a discussion of the adopted places* of the comparison stars on each night when the full number was observed, there were found the following corrections to north polar distance, arising apparently from errors in the adopted zenith-point corrections:

	″		″
July 29,	−0.7	Sept. 24,	+0.4
30,	−0.5	26,	0.0
Aug. 6,	−0.6	Oct. 1,	+0.3
18,	+0.8	2,	+0.3
21,	+0.5	6,	+0.1
27,	−0.6	12,	+0.3
28,	−0.3	14,	+0.1
Sept. 1,	0.0	15,	−0.3
3,	+0.4	17,	+0.4
21,	+0.4	18,	−0.7

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* Washington Observations, volume for 1877, "Mean Places, Miscellaneous Stars for 1877.0, given by individual observations with the Transit Circle."

Applying these corrections to the north polar distances of Mars, as published on page 328, Washington Observations, 1877, we have the following corrections to the tabular place of Mars:

Table XI.

Date.	Correction.	Residuals.	Date.	Correction.	Residuals.
1877.	″	″	1877.	″	″
July 29	+ 5.5	0.2	Sept. 24	+ 4.9	0.6
30	+ 5.6	0.2	26	+ 5.7	0.2
Aug. 6	+ 5.7	0.2	Oct. 1	+ 6.5	1.2
18	+ 5.2	0.9	2	+ 5.7	0.5
21	+ 4.1	1.0	6	+ 4.9	0.2
27	+ 4.9	0.3	9	+ 4.4	0.4
28	+ 5.2	1.1	12	+ 4.1	0.6
Sept. 1	+ 7.0	0.8	14	+ 3.9	0.6
3	+ 7.4	1.2	15	+ 4.2	0.3
15	+ 5.3	0.6	17	+ 4.9	0.6
21	+ 5.2	0.5	18	+ 4.6	0.2

From these corrections, it is seen at a glance that the agreement between the observed and tabular places is fairly uniform, although these quantities still contain the unknown errors of observation and reduction, and the corrections for motion derived from the tabular places seem satisfactory.

The Washington north polar distances of Mars, uncorrected for parallax, were compared with the tabular places in the American Ephemeris, and a series of values C.—O. obtained. These values were better shown graphically than analytically, and from the curve best representing these quantities the residuals in Table XI were obtained. From these residuals, the probable error of a single observation of Mars was found to be ± 0″.452.

From a similar discussion, the Melbourne observations give for the probable error of a single observation of Mars ± 0″.552.

The Leyden observations that have been used in this discussion were similarly treated, and give for the probable error of a single observation ± 0.″311.

The observations at Sydney, Cape of Good Hope, and Cambridge were too few to give results of much weight from this method of treatment, and they were not discussed. The probable errors from the last-mentioned stations were undoubtedly greater than that from the Leydon work, and I have decided to adopt ± 0″.45 as the probable error of a single observation of Mars at each station.

From a discussion of the observations of the comparison stars at Washington on every night when all the stars were observed, the probable error of a single observation, including the work of *all* the observers, was found to be ± 0″.302. From the work of *three* of the observers, the probable error of a single observation was found to be ± 0″.227.

From the Melbourne observations, the probable error of a single observation was found to be $\pm 0''.349$.

From the Leyden observations, the probable error of a single observation was found to be $\pm 0''.255$.

No attempt was made to determine the probable error at the other stations, on account of the small number of observations, but for all the stations the probable error of a single observation has been assumed to be $\pm 0''.33$.

In obtaining the value of π from the foregoing data, and in deducing the motion of Mars from the positions in the American Ephemeris, the following data have been used:

The adopted positions of the observing-stations are as follows:

	Longitude east of Washington.			Latitude.		
	h.	m.	s.	°	′	″
Washington - - - -	0	0	0.0	+38	53	38.8
Cambridge - - - -	0	23	41.1	+42	22	48.1
Leyden - - - - -	5	26	8.3	+52	9	20.3
Cape of Good Hope -	6	22	7.8	−33	56	3.5
Melbourne - - - -	14	48	6.9	−37	49	53.3
Sydney - - - - -	15	13	2.7	−33	51	41.1

For the figure of the earth, the following values of the axes of the terrestrial spheroid have been adopted:

$$a = 20926202, \quad b = 20854895.^*$$

From these values, by means of the ordinary formulæ, we obtain log ρ, radius of the earth at the observing-station, and v, the angle of the vertical, as follows:

	Log ρ	v ′	″
Washington - - - - - -	9.9994192	11	27.62
Cambridge - - - - - -	9.9993002	11	40.89
Leyden - - - - - - -	9.9990808	11	21.63
Cape of Good Hope - - -	9.9995414	10	51.34
Melbourne - - - - - -	9.9994458	11	21.55
Sydney - - - - - - -	9.9995430	10	50.66

The effect of parallax on the north polar distance of Mars at transit at any station $= \pi \, . \, \frac{\rho \sin (z - v)}{r}$, where π is the mean equatorial horizontal parallax of the sun, ρ the radius of the earth at the observing-station, z the zenith distance of Mars, v the angle of the vertical for the station, and r is the distance of Mars from the center of the earth, the sun's mean distance being taken as the unit.

If, in the above formula, the factor of π at a northern station be designated by f, and at a southern station by f', then, in a combination of the results at any two stations, one north and the other south, we shall have for the whole effect of parallax $p = \pi \, (f + f')$. Putting $F = f + f'$, we have for each date $\pi = \frac{p}{F}$.

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*Col. A. R. Clarke, C. B., F. R. S.; Philosophical Magazine, vol. vi, p. 86, 1878.

WEIGHTS.

The adopted probable error of a single observation of Mars is $\pm 0''.45$. The adopted probable error of a single observation of a star is $\pm 0''.33$. Hence, the probable error of the result of a combination of N. and S. observations of Mars is $\sqrt{2 \times 0''.45^2}$.

A similar combination for the same star gives $\sqrt{2 \times 0''.33^2}$, and for n stars the probable error is

$$\sqrt{\frac{2 \times 0''.33^2}{n}}$$

Therefore, the probable error of a single night's work at a pair of stations, one north and one south, is

$$\varepsilon = \sqrt{\left(\sqrt{\frac{2 \times 0''.33^2}{n}}\right)^2 + \left(\sqrt{2 \times 0.45^2}\right)^2}$$

whence $\varepsilon^2 = \frac{2 \times 0''.33^2}{n} \times 2 \times 0''.45^2$; and the weight of the value of π on each day is

$$w = \frac{1}{\varepsilon^2} \times \text{F}.$$

The following table gives the computed values of f and f' for each group of stations:

Table XII.

Washington and Melbourne.

Date.	f	f'	Date.	f	f'
1877.			1877.		
July 29	1.65512	1.03451	Sept. 26	1.86438	1.00626
30	1.66989	1.04322	Oct. 1	1.78107	0.97231
Aug. 6	1.77419	1.09794	2	1.76344	0.96564
21	1.97214	1.16185	6	1,69070	0.93939
27	2.02491	1.16219	9	1.63452	0.92080
28	2.03128	1.16082	12	1.57771	0.90277
Sept. 1	2.04914	1.15141	14	1.53974	0.89116
15	2.00420	1.08060	15	1.52080	0.88549
21	1.93689	1.04059	17	1.48305	0.87442
24	1.89489	1.02000			

Washington and Sydney.

July 29	1.65512	0.89721	Sept. 3	2.05315	0.97679
30	1.66989	0.90466	24	1.89489	0.86591
Aug. 6	1.77419	0.95098	Oct. 12	1.57771	0.77343
18	1.93906	0.99618	14	1.53974	0.76474
21	1.97214	0.99955	15	1.52080	0.76053
Sept. 1	2.04914	0.98384			

TABLE XII—Continued.

Washington and Cape of Good Hope.

Date.	f	f′	Date.	f	f′
1877.			1877.		
Aug. 6	1.77419	0.95369	Sept. 26	1.86438	0.85740
18	1.93906	0.99918	Oct. 1	1.78107	0.82992
Sept. 1	2.04914	0.98697	2	1.76344	0.82461
3	2.05315	0.97992	6	1.69070	0.80410
24	1.89489	0.86876			

Leyden and Melbourne.

July 20	1.79408	0.94969	Sept. 17	2.29237	1.06756
21	1.81052	0.95953	21	2.23705	1.04059
23	1.84379	0.97900	25	2.17193	1.01312
30	1.96312	1.04322	27	2.13641	0.99941
Aug. 6	2.08327	1.09794	Oct. 2	2.04103	0.96564
8	2.11672	1.11114	3	2.02109	0.95903
15	2.22568	1.14654	4	2.00094	0.95249
17	2.25340	1.15328	5	1.98060	0.94600
21	2.30250	1.16185	6	1.96011	0.93939
22	2.31325	1.16294	9	1.89790	0.92080
30	2.36890	1.15520	14	1.79345	0.89116
Sept. 1	2.37858	1.15141	15	1.77263	0.88549
2	2.38032	1.14814	20	1.66983	0.85844
4	2.38090	1.14060			

Cambridge and Melbourne.

Aug. 28	2.12946	1.16082	Sept. 24	1.98254	1.02000
30	2.13675	1.15520	30	1.88229	0.97903
Sept. 16	2.08703	1.07412	Oct. 1	1.86432	0.97231
22	2.01232	1.03375	7	1.75151	0.93325
23	1.99770	1.02687	13	1.63443	0.89692

The following table exhibits the values of F, p, and π in the equation $\pi = \frac{p}{F}$, together with the number of stars observed, and the computed weight for each date. It also gives the value of π deduced from each pair of stations. The quantities inclosed in parentheses have not been employed in deducing the value of π for each pair of stations, nor in obtaining the final result:

TABLE XIII.

Washington and Melbourne.

Date.	F	p	π	Number of Stars.	Weight.
1877.		″	″		
July 29	2.68963	25.15	9.351	8	6.223
30	2.71311	24.67	9.093	8	6.277
Aug. 6	2.87213	25.76	8.969	8	6.645
21	3.13399	27.05	8.631	8	7.251
27	3.18710	28.02	8.792	8	7.374
28	3.19210	28.69	8.988	8	7.386
Sept. 1	3.20055	29.42	9.192	8	7.405
15	3.08480	27.18	8.811	4	6.715
21	2.97748	26.56	8.920	8	6.889
24	2.91489	25.48	8.741	7	6.684
26	2.87064	26.22	9.134	8	6.642
Oct. 1	2.75338	24.66	8.956	8	6.371
2	2.72908	24.28	8.897	8	6.314
6	2.63009	23.64	8.988	7	6.031
9	2.55532	23.41	9.161	4	5.562
12	2.48048	22.30	8.990	8	5.739
14	2.43090	21.70	8.927	7	5.574
15	2.40629	20.82	8.652	8	5.568
17	2.35747	22.10	9.374	5	5.255

$\pi = 8''.9712 \pm 0''.0316.$

Washington and Sydney.

July 29	2.55233	22.88	8.964	5	5.690
30	2.57455	20.50	(7.963)	8	(5.960)
Aug. 6	2.72517	25.90	(9.504)	7	(6.249)
18	2.93524	23.10	(7.870)	6	(6.651)
21	2.97169	26.66	8.971	8	6.876
Sept. 1	3.03298	27.70	9.133	5	6.761
3	3.02994	26.77	8.835	5	6.754
24	2.76080	24.74	8.961	7	6.331
Oct. 12	2.35114	20.62	8.770	4	5.118
14	2.30448	18.39	(7.980)	4	(5.016)
15	2.28133	19.22	8.425	4	4.966

$\pi = 8''.8846 \pm 0''.0546.$

TABLE XIII—Continued.

Washington and Cape of Good Hope.

Date.	F	p	π	Number of Stars.	Weight.
1877.		″	″		
Aug. 6	2.72788	23.86	8.747	6	6.181
18	2.93824	26.71	9.090	6	6.658
Sept. 1	3.03611	29.67	(9.772)	7	(6.962)
3	3.03307	29.00	(9.561)	5	(6.761)
24	2.76365	24.72	8.945	6	6.263
26	2.72178	24.53	9.012	5	6.067
Oct. 1	2.61099	24.25	9.288	5	5.820
2	2.58805	22.83	8.821	5	5.769
6	2.49480	20.74	8.313	5	5.561

$\pi = 8''.8960 \pm 0''.0725.$

Melbourne and Leyden.

July 20	2.74377	24.63	8.977	4	5.973
21	2.77005	23.71	8.559	7	6.352
23	2.82279	25.08	8.885	7	6.473
30	3.00630	26.54	8.828	8	6.956
Aug. 6	3.18121	28.91	9.088	8	7.360
8	3.22786	29.06	9.003	8	7.468
15	3.37222	29.30	8.689	6	7.642
17	3.40668	30.76	9.029	8	7.882
21	3.46435	32.30	9.324	6	7.850
22	3.47619	30.60	8.803	4	7.567
30	3.52410	31.21	8.856	4	7.671
Sept. 1	3.53599	32.55	9.205	5	7.882
2	3.52846	30.88	8.752	8	8.164
4	3.52150	32.53	9.238	6	7.980
17	3.36093	29.97	8.917	4	7.316
21	3.27764	29.60	9.031	8	7.584
25	3.18505	27.83	8.738	7	7.304
27	3.13582	28.27	9.015	8	7.255
Oct. 2	3.00667	26.21	8.717	8	6.957
3	2.98012	26.27	8.815	8	6.895
4	2.95343	26.49	8.969	8	6.834
5	2.92660	25.86	8.836	8	6.771
6	2.89950	26.54	9.153	8	6.709
9	2.81870	25.85	9.171	7	6.463
14	2.68461	24.57	9.152	7	6.156
15	2.65812	24.39	9.176	7	6.095
20	2.52827	23.49	9.291	6	5.729

$\pi = 8''.9693 \pm 0''.0260.$

TABLE XIII—Continued.

Melbourne and Cambridge

Date.	F.	p	π	Number of Stars.	Weight.
1877.		"	"		
Aug. 28	3.29028	30.18	9.172	7	7.545
30	3.29195	30.49	9.262	8	7.617
Sept. 16	3.16115	28.76	9.098	6	7.163
22	3.04607	28.49	9.353	6	6.903
23	3.02457	27.70	9.158	7	6.935
24	3.00254	26.41	8.796	7	6.885
30	2.86132	25.68	8.975	4	6.228
Oct. 1	2.83663	25.81	9.099	7	6.504
7	2.68476	24.82	9.245	6	6.084
13	2.53135	23.33	9.216	6	5.736

$\pi = 9''.1382 \pm 0''.0496.$

In comparing the Washington and Melbourne results on July 30, August 6, and October 14 with those of Washington and Sydney on the same dates, it is evident that there is something abnormal in the Sydney observations. Similar comparisons with observations at other stations indicate defects in the Sydney observations of August 18, and in those of the Cape of Good Hope on September 1 and 3.

Although the rejection of observations is, in most cases, a matter for very serious consideration, these cases seem to me to be so plainly due to some unknown error that I have rejected from the computations of the separate, and from the final values o π, all those results inclosed in parentheses.

Taking the mean of the remaining *seventy* results from all the stations, with regard to the weights, we have—

$$\pi = 8''.980 \pm 0.''0172.$$

The results from the Melbourne and Cambridge combination seem to indicate either that the value found for π is certainly too great, or that the observations at the first five stations are all affected by a systematic error.

This difference may arise from the method of observing over inclined threads at Cambridge, for the agreement of the results among themselves is very satisfactory; but, whatever the cause of the discrepancy may be, it has not been deemed advisable to employ these values in obtaining the final result.

Omitting the results derived from the Cambridge observations, and also those inclosed in parentheses, and taking the mean of the remaining *sixty* results with regard to the computed weights, we have for a final result—

$$\pi = 8''.953 \pm 0''.019.$$

This value of π is undoubtedly greater than would be assigned by a large majority of astronomers, but it fairly represents what the method will give from such observations as were at hand for this discussion.

The prescribed method of observing was *fully* carried out at only *two* stations, and *partially* at one. Where the plan of the circular was strictly followed the character of the work was decidedly superior to that where the directions were disregarded.

In such observations, none but experienced and thoroughly-trained observers should take any part, for there is no more vicious notion among astronomers, both amateur and professional, than the belief that any intelligent man, with a few months' training, can make trustworthy observations with a meridian instrument. No man can become a thoroughly good observer without at least two years' of constant practice, with the best advice; some require at least four years, while there are many who can never become good observers.

The method of determining the solar parallax from meridian observations of Mars has never had a fair trial.

The principal obstacle to be overcome is the desire of each observatory to co-operate in its own way (if at all), thereby wasting its own work and rendering good observations at other stations useless.

I sincerely hope that, at the next favorable opposition of Mars, all astronomers favorably situated will, from their regard for the progress of astronomical knowledge, be able to rise above all jealousies and prejudices, and unite upon some plan to give this method one fair trial before it is condemned.

It has been urged frequently that this method will always give too large a value of π, and for convenience of comparison I append the following table of the modern results from meridian observations:

TABLE XIV.

Stations.	Number of Comparisons.	Values of π		References.
1862.		″		
Pulkowa and Cape of Good Hope . .	13	8.964		Ast. Nach., No. 1409.
Greenwich and Williamstown . . .	20	8″.930	8″.945	Mem. R. A. S., vol. xxxiii.
Greenwich and Cape of Good Hope .	15	8.918		Mem. R. A. S., vol. xxxiii.
Santiago and Washington	12	8.834	8″.767	Washington Obs., 1863, App. A.
Santiago and Washington	9	8.636		Washington Obs., 1863, App. A.
Santiago and Albany	15	8.611		Washington Obs., 1863, App. A.
Santiago and Upsala	6	8.871		Ast. Nach., No. 1615.
1877.				
Washington and Melbourne	19	8.971	8″.953	
Washington and Sydney	7	8.885		
Washington and Cape of Good Hope .	7	8.896		
Melbourne and Leyden	27	8.969		
Melbourne and Cambridge	10	9.138		

Neglecting the last value, for reasons previously mentioned, we find the different results ranging between 8″.971 and 8″.611, and among them some, at least, will not be deemed too large.

Although it has been assumed that this method is certain to give too large a value of π, it is only recently that a definite cause for the error has been assigned.

While conducting some experiments with the 9.6-inch Equatorial upon the disk of Jupiter in November, 1880, with a view to ascertaining the effect of different-colored fields on the apparent relative magnitudes of segments formed on the upper and lower limbs of the planet by the bisecting threads used, as proposed in my circular, I received a note from Mr. DAVID GILL, Her Majesty's astronomer, at the Cape of Good Hope, containing the statement that meridian observations of Mars were not trustworthy, because of a "systematic error due to the chromatic dispersion of the atmosphere. By this, the upper limb will be fringed with blue and the lower limb with red, and there will be a tendency on the part of the observer, particularly in an illuminated field, to cut more deeply into the blue or violet limb than into the more visible red limb—and hence to get too great a value of the parallax." This theory has since appeared in Mr. GILL's paper on the value of the solar parallax, from Heliometer Measures in 1877.

As this statement referred directly to the matter under investigation, I continued the work as long as the weather would permit.

The altitude of Jupiter in November, 1880, was about 12° greater than that of Mars at opposition in 1877.

In a totally dark field with dark threads, I moved the two threads until, to my eye, exactly equal segments were cut from the upper and lower limbs of the disk. This arrangement was intended to give the maximum effect to the red and to the violet or blue fringes on the limbs of the planet. By changing the color of the light in the field it would be easy to detect any change in the relative magnitudes of the two segments due to the effect of colored light on the colored fringes.

When the planet was still in view, the following changes were made in the order given: 1st. With a dark field the threads were illuminated with a faint and then by a strong light. 2d. The field was illuminated with a faint and then with a strong *white* light, the threads remaining dark. 3d. The field was illuminated with a faint and then with a strong *red* light, the threads remaining dark.

These experiments were repeated twice each night for several nights, both as given above and in the reverse order, and though I examined the phenomena with the greatest care, I was unable to see any change whatever in the relative size of the segments under any of the changes of illumination. At the same time the eye was able to detect the change in magnitude arising from the slight movement of one thread, by the micrometer screw. So far as this experiment goes, it shows that, for my eye, the position of the threads would be the same with or without illumination, and, in my own case, Mr. GILL's objection does not hold good.

It is intended to pursue this investigation on the disk of Mars.

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APPENDIX IV.

REPORT

ON THE

DETERMINATION OF THE LONGITUDE

OF THE

CINCINNATI OBSERVATORY

AT

MOUNT LOOKOUT, HAMILTON COUNTY, OHIO.

[Eastman (John Robie)]

U. S. NAVAL OBSERVATORY, *October* 24, 1879.

SIR: I have the honor to present the following Report on the Determination of the Longitude of the Cincinnati Observatory at Mount Lookout, Hamilton County, Ohio. This work was undertaken in 1877 at the request of Prof. ORMOND STONE, Director of the Cincinnati Observatory, who has furnished the accompanying report on the instruments used by him in the work and on the method of determining the corrections and rates of his clock.

The observations and computations at this observatory were made by the observers with the Transit Circle. The following table presents the observations made here for the determination of clock corrections together with the methods of reduction.

The *first* column contains the date of the observations; the *second* column the name of the star; the *third* column the initial of the observer's name: E. denoting Professor EASTMAN; F., Assistant FRISBY; S, Assistant SKINNER; and P., Assistant PAUL. The *fourth* column gives the number of transits observed; the *fifth* column the mean of the transits; the *sixth*, *seventh*, and *eighth* columns the azimuth, level, and collimation corrections; the *ninth* column the sum of the sixth, seventh, and eighth columns; the *tenth* column the observed apparent place of the star; the *eleventh* column the *adopted* right ascensions of the stars, which are those given by the American Ephemeris, with the following corrections:

Star.	Correction.	Star.	Correction.	Star.	Correction.
	s.		s.		s.
Polaris	− 0.36	ε Serpentis . . .	− 0.01	γ Aquilæ	+ 0.03
51 Cephei	+ 0.14	α Scorpii	− 0.02	α Aquilæ	+ 0.04
α^2 Canum Venati. .	+ 0.03	ζ Ophiuchi . . .	0.00	λ Ursæ Minoris . .	− 0.41
θ Virginis . . .	− 0.04	η Herculis . . .	0.00	τ Aquilæ	+ 0.03
α Virginis . . .	− 0.03	κ Ophiuchi . . .	+ 0.07	α^2 Capricorni. . .	+ 0.06
ζ Virginis . . .	− 0.01	α^1 Herculis . . .	+ 0.02	π Capricorni . . .	+ 0.04
η Bootis	− 0.04	α Ophiuchi . . .	+ 0.04	α Cygni	+ 0.04
ε Bootis	+ 0.01	μ^1 Sagittarii . . .	+ 0.03	ν Cygni	− 0.04
α^2 Libræ	0.00	δ Ursæ Minoris . .	− 0.06	61^1 Cygni	+ 0.01
β Libræ	0.00	η Serpentis . . .	+ 0.10	α Aquarii. . . .	+ 0.02
μ^1 Bootis	− 0.04	ι Aquilæ	+ 0.08	ω Piscium . . .	0.00
α Coronæ Borealis .	+ 0.01	α Lyræ	+ 0.03	γ Pegasi	+ 0.01
α Serpentis . . .	+ 0.03	β Lyræ	+ 0.04		

The *twelfth* column contains the observed clock corrections, and the *thirteenth* column contains the difference between the *adopted* clock correction, computed for a given epoch on each night, and each *observed* correction when corrected for rate.

Observations at the United States Naval Observatory for the Determination of the Clock Corrections and Rates.

Date.	Star.	Observer.	Number of Transits.	Mean Thread.	*Aa*	*Bb*	*Cc*	Instrumental Corrections.	Corrected Transit.	Adopted Right Ascen.	Observed Clock Corr.	*v*
1877.				h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
May 28	α^2 Can. Venat.	E.	9	12 50 28.84	0.000	−0.076	+0.113	+0.04	28.88	19.20	− 9.68	0.03
	θ Virginis. .	E.	9	13 3 47.67	−0.692	−0.043	+0.087	−0.65	47.02	37.34	.68	.03
	Polaris, S. P.	E.	7	13 41.17	. .	+1.528	−3.747	. .	. .	55.68	. .	. .
	α Virginis. .	E.	9	18 55.76	−0.769	−0.039	+0.087	−0.72	55.04	45.33	.71	.01
	ζ Virginis. .	E.	9	28 38.43	.627	.046	.084	−0.59	37.84	28.11	.73	.04
	η Bootis . .	E.	9	13 49 2.46	.359	.059	.088	−0.33	2.13	52.42	.71	.03
	β Libræ . .	E.	9	15 10 36.78	.747	.040	.076	−0.71	36.07	26.28	.79	.15
	μ^1 Bootis . .	E.	9	20 3.38	.024	.075	.095	0.00	3.38	53.73	.65	.01
	α Cor. Borealis	E.	9	29 41.52	.229	.065	.082	−0.21	41.31	31.80	.51	.12
	α Serpentis .	E.	9	38 25.62	.533	.050	.073	−0.51	25.11	15.52	.59	.04
	ε Serpentis .	E.	9	15 44 54.22	−0 559	−0.049	+0.072	−0.54	53.68	44.05	− 9.63	.01
May 31	α^2 Can. Venat. .	P.	9	12 50 28.94	0.000	−0.125	+0.157	+0.03	28.97	19.16	− 9.81	0.13
	θ Virginis. .	P.	9	13 3 47.84	−0.619	−0.070	+0.120	−0.57	47.27	37.32	.95	.02
	Polaris, S. P.	P.	9	13 40.48	. .	+2.512	−5.105	. .	. .	58 00	. .	. .
	α Virginis. .	P.	9	18 55.90	−0.689	−0.064	+0.119	−0.63	55.27	45.32	.95	.02
	ζ Virginis. .	P.	9	28 38.55	.561	.075	.115	−0.52	38.03	28.10	.93	.00
	η Bootis . .	P.	9	13 49 2.54	.321	.096	.119	−0.30	2.24	52.41	.83	.09
	ε Bootis . .	P.	9	14 39 49.94	.197	.107	.116	−0.19	49.75	39.88	9.87	.04
	α^2 Libræ . .	P.	9	14 44 18.16	.753	.059	.106	−0.71	17.45	7.41	10.04	.13
	β Libræ . .	P.	9	15 10 36.96	.668	.066	.097	−0.64	36.32	26.30	10.02	.12
	μ^1 Bootis . .	P.	9	20 3.59	.021	.123	.120	−0.02	3.57	53.73	9.84	.06
	α Cor. Borealis	P.	9	15 29 41.93	−0.205	− .107	+0.103	−0.21	41.72	31.81	− 9.91	0.02
July 13	β Libræ . .	S.	9	15 10 32.26	−0.744	−0 046	+0.121	−0.67	31.59	26.20	− 5.39	0.03
	μ^1 Bootis . .	S.	9	19 58.71	.024	.056	.152	+0.04	58.75	53.36	.39	.03
	α Cor. Borealis	S.	9	29 37.07	.228	.075	.133	−0.17	36.90	21.59	.31	.05
	α Serpentis .	S.	9	38 21.30	.531	.058	.119	−0.47	20.83	15 48	.35	.01
	ε Serpentis .	S.	9	15 44 49.91	.557	.057	.117	−0.50	49.41	44.05	.36	.00
	α Ophiuchi .	S.	9	17 29 22.43	.436	.063	.118	−0.38	22.05	16.71	.34	.01
	μ^1 Sagittarii .	S.	9	18 6 34.50	.922	.036	0.108	−0.85	33.65	28.36	.29	.06
	δ Ursæ Min. .	S.	5	12 1.36	. .	.773	1.690	. .	. .	8.09	. .	. .
	η Serpentis .	S.	9	15 6.18	.663	.051	0.100	−0.61	5.57	0.21	.36	.01
	ι Aquilæ . .	S.	9	18 28 40.48	.736	.047	.100	−0.68	39.80	34.45	.35	.01
	γ Aquilæ . .	S.	9	19 40 33.87	.483	.061	.091	−0.45	33.42	28.05	.37	.03
	α Aquilæ . .	S.	9	44 56.11	.508	0.059	0.091	−0.48	55.63	50.29	.34	.00
	λ Ursæ Min. .	S.	4	46 53.35	. .	2.350	4.790	. .	. .	31.73	. .	. .
	τ Aquilæ . .	S.	9	19 58 17.01	.530	0.058	0.088	−0.50	16.51	11.26	.25	.09
	α^2 Capricorni .	S.	9	20 11 23.68	.800	.043	.088	−0.76	22.92	17.52	.40	.06
	π Capricorni .	S.	9	20 20 26.84	−0.884	−0.039	+0.090	−0.83	26.01	20.67	− 5.34	.00

Observations for the Determination of the Clock Corrections and Rates—Continued.

Date.	Star.	Observer.	Number of Transits.	Mean Thread.	*Aa*	*Bb*	*Cc*	Instrumental Corrections.	Corrected Transit.	Adopted Right Ascen.	Observed Clock Corr.	*v*
1877.				h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
July 14	α Scorpii . .	P.	9	16 21 2.27	−0.997	−0.067	+0.135	−0.93	1.34	55.60	− 5.74	0.09
	ζ Ophiuchi .	P.	9	30 32.86	−0.759	.094	.122	−0.73	32.13	26.49	.64	.02
	η Herculis. .	P.	9	38 49.34	+0.004	.183	.155	−0.02	49.32	43.67	.65	.01
	κ Ophiuchi .	P.	9	16 52 0.08	−0.490	.126	.121	−0.50	59.58	53.91	.67	.01
	α¹ Herculis. .	P.	9	17 9 11.54	.421	0.133	0.122	−0.43	11.11	5.48	.63	.04
	δ Ursæ Min. .	P.	5	18 12 0.92	. .	1.614	1.901	. .	. .	7.91	. .	. .
	α Lyræ. . .	P.	9	32 55.16	.004	−0.182	+0.143	−0.04	55.12	49.51	.61	.08
	51 Cephei, S. P.	P.	5	42 33.54	. .	+1.735	−2.280	. .	. .	10.86	. .	. .
	β Lyræ . .	P.	9	18 45 41.19	.117	−0.169	+0.131	−0.16	41.03	35.43	.60	.09
	γ Aquilæ . .	P.	9	19 40 34.26	.480	.127	.109	−0.50	33.76	28.06	.70	.09
	α Aquilæ . .	P.	9	44 56.54	.505	.124	.108	−0.52	56.02	50.30	.72	.02
	τ Aquilæ . .	P.	9	19 58 17.54	.527	.121	.106	−0.54	17.00	11.27	.73	.02
	α² Capricorni .	P.	9	20 11 24.06	−0.796	−0.090	+0.107	−0.78	23.28	17.52	− 5.76	0.05
Oct. 1	γ Aquilæ . .	F.	9	19 40 47.09	−0.666	−0.039	+0.138	−0.57	46.52	27.63	−18.89	0.07
	α Aquilæ . .	F.	9	45 9.39	−0.701	0.038	0.136	−0.60	8.79	49.91	.88	.06
	λ Ursæ Min. .	F.	5	45 41.36	. .	1.528	7.305	. .	. .	25.32	. .	. .
	τ Aquilæ . .	F.	9	19 58 30.51	−0.732	0.038	0.134	−0.64	29.87	10.97	.90	.08
	α Cygni . .	P.	9	20 37 35.11	+0.197	.062	.182	+0.32	35.43	16.75	.68	.13
	ν Cygni . .	F.	9	20 52 56.47	+0.056	.058	.168	+0.17	56.64	37.91	.73	.08
	61¹ Cygni . .	F.	9	21 1 44.72	−0.025	.056	.160	+0.08	44.80	26.11	.69	.12
	α Aquarii . .	F.	9	21 59 51.43	−0.877	.034	.119	−0.79	50.64	31.75	.89	.09
	ω Piscium . .	F.	9	23 53 23.26	−0.745	.037	.107	−0.68	22.58	3.73	.85	.06
	γ Pegasi . .	F.	9	0 7 17.44	−0.585	−0.041	+0.108	−0.52	16.92	58.16	−18.76	0.03

INSTRUMENTAL CONSTANTS.

The constants, *a*, *b*, and *c*, employed in the above reductions, were determined according to the methods described in the Introduction to the Transit Circle Observations in the Washington Observations for 1877, and their values on each night are given in the table below:

Date.	Sid. Hour.	*c*	*b*	*a*
1877.	h.	s.	s.	s.
May 28	12.8	+ 0.088	− 0.059	− 0.997
	18.2	+ 0.059		
31	13.2	+ 0.118	− 0.111	− 0.892
	15.5	+ 0.092		
July 13	15.2	+ 0.120	− 0.127	− 0.993
	18.2	+ 0.100		
14	16.3	+ 0.121	− 0.142	− 0.987
	21.3	+ 0.100		
October 1	20.0	+ 0.133	− 0.044	− 1.372
	0.1	+ 0.105		

The "personal equation" of the observers of this Observatory was determined by the use of the apparatus described in the Introduction to the Transit-Circle work in the annual volume for 1875.

The following table presents the adopted clock corrections and rates, together with the corrections to be applied to the clock corrections for the personal error of the observer:

Date.		Observer.	Sidereal Hour.	Clock Correction.	Computed Probable error.	Corr. for Personal Equation.	Hourly Rate.
1877.			h.	s.	s.	s.	s.
May	28	E.	13.30	− 9.703	± 0.015	+ 0.105	+0.0320
	31	P.	13.30	− 9.930	± 0.018	+ 0.131	+0.0169
July	13	S.	17.30	− 5.348	± 0.007	− 0.020	+0.0047
	14	P.	17.40	− 5.666	± 0.011	+ 0.208	−0.0143
Oct.	1	F.	20.00	−18.819	± 0.020	+ 0.024	+0.0082

OBSERVATIONS AT THE CINCINNATI OBSERVATORY.

The Transit Instrument employed in the determination of time at Mount Lookout was made by Buff & Berger of Boston. It is mounted on a heavy stone pier and has a clear aperture of 73 millimeters and a focal length of 73 centimeters. It is furnished with a diagonal eye-piece, magnifying 85 diameters, and a reversing carriage. The value of one division of the level is 1″.82. The clock used was Molyneux No. 151, rated to mean time. It is connected with the chronograph in a manner precisely similar to that employed in the Naval Observatory and described in Professor HARKNESS' "Report on the Difference of Longitude between Washington and Havana," the pendulum closing the circuit every second. In reading off the chronograph sheets the fractions of a second were always measured from the *even* second.

For a single determination of time, one star was observed north and another south of the zenith, and when convenient at approximately equal zenith distances. The instrument was then reversed and one north and one south star observed. When possible two such determinations were made each evening, the signals being transmitted in the interval between the two.

In the reductions Hansen's formula was used. In computing the term $i \sec \varphi$ (= inclination), the latitude was assumed to be $+ 39^\circ\ 8'.6$.

For the transmission of signals a relay and a sounder were placed side by side and so connected that each would open or close the circuit automatically. Signals from Mount Lookout were transmitted through the sounder on May 28th and 31st and July 13th. On these nights the signals were reversed; that is, the switches were so arranged that when the main line and the Mount Lookout clock circuits were closed the Mount Lookout chronograph circuit was opened. On July 14th and October 1st the Washington signals were received directly without transmission through the sounder. In sending signals on the latter evenings the switches were so arranged that closing the sounder circuit closed the main line.

The signals received from Washington were compared with the beats of the Molyneux clock as recorded on the chronograph by means of coincidences. On May 28th and 31st the Molyneux clock was assumed to be gaining 0.045 second per hour; on the other nights it was assumed to be gaining 0.042 second per hour.

List of Time Stars used at Mount Lookout.

Star.	α 1877.0			δ 1877.0	
	h.	m.	s.	°	′
δ Ursæ Majoris	12	9	20.03	+ 57	42.9
η Virginis	12	13	36.76	0	1.0
24 Comæ Berenices, seq.	12	28	57.55	19	3.3
76 Ursæ Majoris	12	36	11.11	63	23.3
δ Virginis	12	49	24.48	4	4.0
17 Canum Venaticorum	13	4	24.20	39	9.2
20 Canum Venaticorum	13	12	1.52	41	13.2
109 Virginis	14	40	1.87	2	24.7
Groombridge 2164	14	48	19.08	59	47.7
ν Bootis, prec.	15	26	30.66	41	15.2
ζ Coronæ Borealis, seq.	15	34	44.75	37	2.2
β Serpentis	15	40	30.67	15	48.5
ε Coronæ Borealis	15	52	29.80	27	14.1
Groombridge 2296	15	54	52.34	55	5.9
φ Herculis	16	4	53.48	45	15.5
γ Herculis	16	16	29.65	19	26.6
η Draconis, seq.	16	22	19.84	61	47.6
χ Herculis	17	23	28.62	48	21.8
α Ophiuchi	17	29	13.49	12	39.1
ι Herculis	17	35	59.89	46	4.4
μ Herculis	17	41	38.70	27	47.6
ζ Pegasi	22	35	19.60	10	11.4
ι Cephei	22	45	18.25	65	33.2
α Pegasi	22	58	38.09	14	32.6
Brisbane 3077	23	7	21.93	+ 56	29.4

Observations at Mount Lookout.

Date.	Star.	Clamp.	No. of transits.	Transit over Mean Wire.			Aberration.	Inclination.	*n* (tan δ − tan φ)	*c* sec δ	Corrected Transit.	Adopted Time of Culmination.	Observed Clock Correction.
1877.				h.	m.	s.	s.	s.	s.	s.	s.	s.	s.
May 28	δ Ursæ Majoris	E.	6	7	42	35.99	−0.03	−0.19	+0.02	+0.41	36.20	40.62	+ 4.42
	η Virginis	E.	11	7	46	51.06	−0.02	−0.25	+0.02	+0.22	50.99	55.41	+ 4.42
	24 Comæ, seq.	W.	11	8	2	10.03	−0.02	−0.24	−0.01	−0.23	9.53	13.95	+ 4.42
	ν Bootis, prec.	W.	11	10	59	14.52	−0.02	+0.27	0.00	−0.22	14.55	18.66	+ 4.11
	ζ Coronæ Bor., seq.	W.	5	11	7	27.26	−0.02	+0.14	0.00	−0.21	27.17	31.33	+ 4.16
	β Serpentis	E.	11	11	13	11.73	−0.02	+0.12	+0.04	+0.17	12.04	16.16	+ 4.12
	Groom. 2296	E.	11	11	27	31.44	−0.03	+0.21	−0.05	+0.27	31.84	36.01	+ 4.17
31	76 Ursæ Majoris	W.	5	7	57	39.13	−0.04	+0.03	−0.10	+0.27	39.29	39.99	+ 0.70
	δ Virginis	W.	5	8	10	48.96	−0.02	−0.03	+0.07	+0.12	49.10	49.71	+ 0.61
	17 Canum Venat.	E.	5	8	25	47.01	−0.02	−0.03	0.00	−0.16	46.80	47.50	+ 0.70
	20 Canum Venat.	E.	5	8	33	23.17	−0.02	+0.05	0.01	−0.16	23.03	23.64	+ 0.61
	109 Virginis	E.	11	10	1	8.90	−0.02	−0.06	+0.05	+0.02	8.89	9.42	+ 0.53
	Groom. 2164	E.	11	10	9	25.65	−0.03	+0.18	−0.05	+0.04	25.79	26.28	+ 0.49
	ν Bootis, prec.	W.	5	10	47	30.37	−0.02	+0.07	0.00	−0.02	30.40	30.93	+ 0.53
	ζ Coronæ Bor., seq.	W.	5	10	55	43.09	−0.02	+0.05	0.00	−0.02	43.10	43.60	+ 0.50
July 13	ε Coronæ Borealis.	W.	11	8	24	2.92	−0.02	+0.07	−0.10	−0.40	2.47	21.24	+18.77
	φ Herculis	W.	11	8	36	24.92	−0.02	−0.03	+0.07	−0.51	24.43	42.92	+18.49
	γ Herculis	E.	11	8	47	58.52	−0.02	+0.05	−0.15	+0.38	58.78	17.27	+18.49
	η Draconis, seq.	E.	3	8	53	46.81	−0.04	−0.04	+0.34	+0.76	47.83	6.60	+18.77
	χ Herculis	E.	11	9	54	46.32	−0.02	+0.19	+0.14	+0.43	47.06	5.30	+18.24
	α Ophiuchi	E.	11	10	0	30.91	−0.02	−0.06	−0.26	+0.30	30.87	49.45	+18.58
	ι Herculis	W.	11	10	7	16.23	−0.02	+0.07	+0.10	−0.42	15.96	34.55	+18.59
	μ Herculis	W.	11	10	12	54.63	−0.02	+0.10	−0.13	−0.33	54.25	12.49	+18.24
14	χ Herculis	W.	11	9	50	53.19	−0.02	−0.34	+0.07	−0.93	51.97	9.39	−17.42
	α Ophiuchi	W.	5	9	56	37.04	−0.02	−0.24	+0.13	−0.63	36.02	53.53	+17.51
	ι Herculis	E.	11	10	3	20.35	−0.02	−0.16	+0.05	+0.89	21.11	38.63	+17.52
	μ Herculis	E.	11	10	8	58.78	−0.02	−0.25	−0.06	+0.70	59.15	16.57	+17.42
Oct. 1	ζ Pegasi	W.	5	9	52	27.76	−0.02	−0.04	−0.03	−0.65	27.02	33.20	−53.82
	ι Cephei	W.	11	10	2	25.21	−0.04	+0.04	+0.06	−1.55	23.72	29.93	−53.79
	α Pegasi	E.	11	10	15	41.10	−0.02	−0.04	−0.02	+0.66	41.68	47.90	−53.78
	Brisbane 3077	E.	10	10	24	23.11	−0.03	−0.06	+0.03	+1.16	24.21	30.39	−53.82

Date.	Mount Lookout Mean Time.	Equations of Condition.	Residuals.	Results.
1877.	h.	s.		s.
May 28	7.8	$+ 0.77n + 1.87c + t = + 4.85$	. .	$n = + 0.02$
		$- 0.81n + 1.00c + t = + 4.62$	. .	$c = + 0.22$
		$- 0.47n - 1.06c + t = + 4.18$	. .	$t = + 4.42$
	11.2	$+ 0.06n - 1.33c + t = + 3.89$	− 0.03	$n = - 0.08$
		$- 0.06n - 1.25c + t = + 3.95$	+ 0.02	$c = + 0.17$
		$- 0.53n + 1.04c + t = + 4.33$	− 0.02	$t = + 4.14$
		$+ 0.62n + 1.75c + t = + 4.39$	+ 0.03	
May 31	8.3	$+ 1.18n - 2.23c + t = + 0.87$	+ 0.04	$n = - 0.09$
		$- 0.74n - 1.00c + t = + 0.80$	− 0.05	$c = - 0.12$
		$0.00n + 1.29c + t = + 0.54$	+ 0.04	$t = + 0.66$
		$+ 0.06n + 1.33c + t = + 0.44$	− 0.05	
	10.5	$- 0.77n + 1.00c + t = + 0.60$	+ 0.02	$n = - 0.06$
		$+ 0.90n + 1.99c + t = + 0.48$	− 0.02	$c = + 0.02$
		$+ 0.06n - 1.33c + t = + 0.51$	+ 0.02	$t = + 0.51$
		$- 0.06n - 1.25c + t = + 0.48$	− 0.01	
July 13	8.7	$- 0.30n - 1.12c + t = + 18.27$	+ 0.14	$n = + 0.33$
		$+ 0.20n - 1.42c + t = + 18.05$	− 0.14	$c = + 0.36$
		$- 0.46n + 1.06c + t = + 18.72$	− 0.14	$t = + 18.63$
		$+ 1.05n + 2.12c + t = + 19.87$	+ 0.14	
	10.1	$+ 0.31n + 1.50c + t = + 18.81$	− 0.17	$n = + 0.45$
		$- 0.59n + 1.02c + t = + 18.62$	+ 0.17	$c = + 0.29$
		$+ 0.22n - 1.44c + t = + 18.27$	+ 0.18	$t = + 18.41$
		$- 0.29n - 1.13c + t = + 17.78$	− 0.17	
July 14	10.0	$+ 0.31n - 1.50c + t = + 16.56$	− 0.05	$n = + 0.22$
		$- 0.59n - 1.02c + t = + 16.75$	+ 0.04	$c = + 0.62$
		$+ 0.22n + 1.44c + t = + 18.46$	+ 0.05	$t = + 17.47$
		$- 0.29n + 1.13c + t = + 18.06$	− 0.05	
Oct. 1	10.1	$- 0.63n - 1.02c + t = - 54.50$	− 0.02	$n = + 0.04$
		$+ 1.39n - 2.42c + t = - 55.28$	+ 0.01	$c = + 0.64$
		$- 0.55n + 1.03c + t = - 53.14$	+ 0.02	$t = - 53.80$
		$+ 0.70n + 1.81c + t = - 52.63$	− 0.02	

Signals from Washington to Cincinnati.

Date.	Kessels.	Molyneux.	Corr. to be applied to Molyneux.
1877.	h. m. s.	h. m. s.	s.
May 28	14 4 14	9 7 34	+ 4.30
31	14 15 15	9 6 49	+ 0.60
July 13	17 19 5	9 20 51	+ 18.52
14	17 25 28	9 23 18	+ 17.50
Oct. 1	22 26 49	9 13 11	− 53.76

Results of Observations to Determine Correction for Professor Stone's Personal Equation.

Date.	
1877.	s.
Oct. 26	− 0.14
Nov. 1	− 0.11
2	− 0.10
3	− 0.09
6	− 0.12
Mean .	− 0.11

CORRECTIONS OF THE CINCINNATI CLOCK.

Professor STONE reports that a systematic correction of $+0^s.02$ is required to reduce the star-places used by him to those used at this Observatory. A personal equation apparatus, similar to the one used at the Naval Observatory, was used by Professor STONE on *five* different days, and the correction of $-0^s.11$, to an observed transit, was deduced. These corrections are applied in the following table:

Date	Cincinnati Mean Time.	Observed Clock Corr.	Corr. for Diff. of Star places.	Corr. for Personal Equation.	Adopted Clock Corr.
	h.	s.	s.	s.	s.
May 28	7.8	+ 4.42	+ 0.02	+ 0.11	+ 4.55
	11.2	+ 4.14	+ 0.02	+ 0.11	+ 4.27
31	8.3	+ 0.66	+ 0.02	+ 0.11	+ 0.79
	10.5	+ 0.51	+ 0.02	+ 0.11	+ 0.64
July 13	8.7	+ 18.63	+ 0.02	+ 0.11	+ 18.76
	10.1	+ 18.41	+ 0.02	+ 0.11	+ 18.54
14	10.0	+ 17.47	+ 0.02	+ 0.11	+ 17.60
Oct. 1	10.1	− 53.80	+ 0.02	+ 0.11	− 53.67

The signals from Washington to Cincinnati were received on the Cincinnati chronograph, and the comparisons obtained by coincidence of beats. These comparisons, with the corrections for the two clocks, at the adopted times, are given in the following table:

Signals from Washington to Cincinnati.

Date.	Washington Clock.			Cincinnati Clock.		
	h.	m.	s.	h.	m.	s.
May 28	14	4	14.00	9	7	34.00
		−	9.57		+	4.43
	14	4	4.43	9	7	38.43
31	14	15	15.00	9	6	49.00
		−	9.78		+	0.73
	14	15	5.22	9	6	49.73
July 13	17	19	5.00	9	20	51.00
		−	5.37		+	18.65
	17	18	59.63	9	21	9.65
14	17	25	28.00	9	23	18.00
		−	5.46		+	17.63
	17	25	22.54	9	23	35.63
Oct. 1	22	26	49.00	9	13	11.00
		−	18.78		−	53.63
	22	26	30.22	9	12	17.37

The signals from Cincinnati to Washington were received on the Washington chronograph, and the comparison was made by reading off *twenty-three* signals on each night, reading only the *even* seconds beats of the Cincinnati clock. These comparisons, with the corrections for the two clocks, and the adopted times are given in the following table:

Signals from Cincinnati to Washington.

Date.	Washington Clock.			Cincinnati Clock.		
	h.	m.	s.	h.	m.	s.
May 28	14	31	22.55	9	34	38.00
		−	9.56		+	4.41
	14	31	12.99	9	34	42.41
31	14	28	6.28	9	19	38.00
		−	9.78		+	0.72
	14	27	56.50	9	19	38.72
July 13	17	13	51.29	9	15	38.00
		−	5.37		+	18.65
	17	13	45.92	9	15	56.65
14	17	13	46.32	9	11	38.00
		−	5.46		+	17.64
	17	13	40.86	9	11	55.64
Oct.	22	34	17.42	9	21	38.00
		−	18.77		−	53.63
	22	33	58.65	9	20	44.37

Changing the preceding times from the Washington sidereal clock into Washington mean time, the following table exhibits the results of the exchange of signals and the deduced longitude of the Cincinnati Observatory:

Date.	Signals to Cincinnati.		Signals from Cincinnati.		Difference of Signals.	Longitude.	Wave and Armature Time.
	Washington Clock.	Cincinnati Clock.	Washington Clock.	Cincinnati Clock.			
	h. m. s.	h. m. s.	h. m. s.	h. m. s.	m. s.	m. s.	s.
May 28	9 37 7.64	9 7 38.41	. . . .	. . . .	29 29.23	. . .	. .
			10 4 11.76	9 34 42.40	29 29.36	29 29.30	0.065
31	9 36 18.90	9 6 49.72	. . . .	. . . .	29 29.18	. . .	. .
			9 49 8.07	9 19 38.72	29 29.35	29 29.26	0.085
July 13	9 50 38.92	9 21 9.65	. . . .	. . . .	29 29.27	. . .	. .
			9 45 26.07	9 15 56.67	29 29.40	29 29.33	0.065
14	9 53 4.87	9 23 35.64	. . . .	. . . .	29 29.23	. . .	. .
			9 41 25.11	9 11 55.63	29 29.48	29 29.36	0.125
Oct. 1	9 42 46.39	9 13 17.37	. . . .	. . . .	29 29.02	. . .	. .
			9 50 13.59	9 20 44.37	29 29.22	29 29.12	0.100

Giving the results on July 14 and October 1 half weight, the mean is $29^{m}\ 29^{s}.28$.

The Transit Circle of the Naval Observatory is $0^{s}.066$ *west* of the center of the old dome from which longitude is reckoned, and the Transit at Cincinnati is $0^{s}.021$ *west* of the Cincinnati dome; hence, the dome of the Cincinnati Observatory is

$$29^{m}\ 29^{s}.33$$

west of the old dome of the U. S. Naval Observatory.

Mr. M. MAREAN, of the Western Union Telegraph Office, attended to all the telegraph work at this Observatory with his usual skill and courtesy.

Very respectfully,

J. R. EASTMAN,
Professor of Mathematics, U. S. Navy.

Rear-Admiral JOHN RODGERS, U. S. N.,
Superintendent U. S. Naval Observatory.

APPENDIX V—1877.

LONGITUDE OF THE MORRISON OBSERVATORY,
GLASGOW, MO.

BY

PROF. J. R. EASTMAN, U. S. N., AND HENRY S. PRITCHETT, A. M.

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UNITED STATES NAVAL OBSERVATORY,
Washington, D. C., December 15, 1880.

SIR: I have the honor to present the following report of the determination of the longitude of the Morrison Observatory in Glasgow, Mo.

This determination was undertaken at the request of Mr. HENRY S. PRITCHETT, astronomer at the Morrison Observatory.

The observations and computations at the Morrison Observatory were made by Mr. PRITCHETT, and are embodied in his letter, which will be found in this report.

The arrangement for the exchange of signals on each night was, briefly, to allow the Washington clock to break the closed circuit from Washington to Glasgow, including of course the necessary divisions of the main line by means of repeaters, each second for three minutes, recording each break on the chronograph at Washington and on the chronograph at Glasgow. Then the Glasgow clock was allowed to break the circuit in the same way for three minutes. The *hour* and the *first* and *last* minute of the recorded signals of the Washington clock were telegraphed to Glasgow, and similar data in relation to the Glasgow clock were received from Glasgow; and this completed the exchange of signals.

Similar apparatus was used at both stations for sending and receiving signals.

OBSERVATIONS AT THE UNITED STATES NAVAL OBSERVATORY.

The observations for the determination of the clock corrections at the Naval Observatory were made by Prof. J. R. EASTMAN, U. S. N., with the Transit Circle. A description of this instrument and an explanation of the methods of reduction may be found in any of the annual volumes of the Observatory since 1870.

For clock corrections in this determination of longitude, only stars of the American Ephemeris were observed, and the corrections given in the table below were applied to the positions given in the Ephemeris. The corrections employed in the computations at the Morrison Observatory are from the same list of systematic corrections.

Corrections to American Ephemeris.

	s.		s.		s.
Polaris	− 0.36	β Ursæ Minoris	. .	ζ Ophiuchi	0.00
48 Cephei	. .	β Bootis	+ 0.03	η Herculis	− 0.01
12 Canum Venat.	+ 0.03	μ^1 Bootis	− 0.05	κ Ophiuchi	0.08
θ Virginis	− 0.05	u Coronæ Borealis	+ 0.01	d Herculis	+ 0.20
ζ Virginis	0.01	α Serpentis	0.03	ϵ Ursæ Minoris	. .
η Bootis	− 0.04	ϵ Serpentis	− 0.01	u^1 Herculis	+ 0.02
θ Bootis	+ 0.08	ϵ Coronæ Borealis	− 0.05	a Ophiuchi	0.04
5 Ursæ Minoris	. .	δ Ophiuchi	+ 0.02	μ Herculis	+ 0.04
ϵ^2 Bootis	+ 0.01	τ Herculis	+ 0.18	δ Ursæ Minoris	− 0.06
o^2 Libræ	0.00	η Draconis	− 0.01		

In the case of 48 Cephei, 5 Ursæ Minoris, β Ursæ Minoris, and ε Ursæ Minoris the uncorrected ephemerides were used, as no well authenticated corrections were known.

The *azimuth* constant was obtained by the method of least squares from *all* the observations on each night.

The *level* constant was obtained from observations with the hanging level.

The *collimation* constant was obtained from observations with two opposing collimating telescopes in the usual way, and, as the constant varies with the temperature, two values are given on each night at the hours noted in the table below, and the values for other epochs were interpolated on the assumption that the rate of change of temperature was uniform.

Constants used in the Reduction of Observations.

Date.	Hour.	*c*	*b*	*a*
1880.		s.	s.	s.
June 16	14.7	− 0.006	− 0.200	− 1.165
	17.0	+ .004		
17	12.8	− .052	− 0.080	− 1.309
	16.3	.012		
19	14.4	.033	− 0.207	− 1.301
	16.9	.013		
21	14.4	.061	− 0.212	− 1.183
	16.7	.055		
July 2	15.0	.056	− 0.220	− 1.246
	18.2	− 0.040		

Observations and deduced Clock Corrections at the Naval Observatory.

Date.	Star.	Observer.	No. of Threads.	Mean Thread.	*A a*	*B b*	*C c*	Instrumental Correction.	Corr. Transit.	Adopted Right Ascension.	Observed Clock Correct'n.	*v*
1880.				h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
June 16	ι^2 Libræ . . .	E.	9	14 44 44.41	−0.984	−0.120	−0.006	− 1.11	43.30	18.10	−25.20	0.03
	β Ursæ Minoris	E.	8	51 31.14	+2.571	.613	.023	+ 1.94	33.08	7.83	. .	. .
	β Bootis . .	E.	9	14 57 54.16	+0.052	.264	.007	− 0.22	53.94	28.74	.20	.02
	μ^1 Bootis . .	E.	9	15 20 26.23	−0.028	.253	.004	.28	25.95	0.68	.27	.05
	ε Serpentis .. .	E.	9	15 45 19.70	.655	.166	−0.002	.82	18.88	53.66	.22	.00
	δ Ophiuchi . .	E.	9	16 8 33.31	−0.785	.148	.000	.93	32.38	7.21	.17	.05
	τ Herculis . .	E.	8	16 36.69	+0.227	.288	+0.001	0.06	36.63	11.37	.26	.04
	ζ Ophiuchi . .	E.	9	31 3.34	−0.896	.133	.002	1.03	2.31	37.05	.26	.04
	η Herculis . .	E.	9	39 15.73	+0.007	.258	.003	0.25	15.48	50.26	.22	.00
	κ Ophiuchi . .	E.	9	52 28.89	−0.580	.177	.003	.75	28.14	2.94	.20	.01
	d Herculis . .	E.	9	57 39.46	−0.125	0.240	.005	− 0.36	39.10	13.94	−25.16	0.05
	ε Ursæ Minoris	E.	6	16 58 44.25	+5.916	−1.076	+0.030	+ 4.87	49.12	23.94	. .	. .

Observations and deduced Clock Corrections at the Naval Observatory—Continued.

Date.	Star.	Observer.	No. of Threads.	Mean Thread.	*Aa*	*Bb*	*Cc*	Instrumental Correction.	Corr. Transit.	Adopted Right Ascension.	Observed Clock Correct'n.	*v*
1880.				h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
June 17	12 Canum Venat.	E.	9	12 50 53.54	+0.003	−0.103	−0.067	− 0.17	53.37	27.56	−25.81	0.05
	θ Virginis . .	E.	9	13 4 13.90	−0.908	−0.058	−0.049	1.02	12.88	47.16	.72	.04
	Polaris, S. P. .	E.	8	15 46.21	4.464	+2.098	+2.022	40.52	5.69	39.94	. .	. .
	ζ Virginis . .	E.	9	29 4.46	0.823	−0.062	−0.044	0.93	3.53	37.78	.75	.01
	η Bootis. . .	E.	9	13 49 27.59	− .471	.080	.043	− .59	27.00	1.30	.70	.06
	θ Bootis. . .	E.	9	14 21 35.29	+ .500	.128	.056	+ .32	35.61	9.81	.80	.04
	β Bootis. . .	E.	9	14 57 54.60	+ .059	.106	.036	− .08	54.52	28.73	.79	.03
	μ^1 Bootis. . .	E.	9	15 20 26.66	− .031	.101	.030	.16	26.50	0.67	.83	.07
	ε Serpentis . .	E.	9	45 20.22	.736	.066	.018	.82	19.40	53.66	.74	.02
	ε Cor. Borealis.	E.	9	15 53 6.72	.298	.088	.019	.40	6.32	40.58	.74	.02
	δ Ophiuchi . .	E.	9	16 8 33.90	−0.882	−0.059	−0.014	− 0.96	32.94	7.21	25.73	.03
19	θ Bootis. . .	E.	9	14 21 36.26	+0.497	−0.330	−0.054	+ 0.11	36.37	9.77	26.60	.01
	5 Ursæ Minoris	E.	9	28 15.76	+3.315	.691	.134	+ 2.49	18.25	51.25	. .	. .
	ε^2 Bootis. . .	E.	9	40 15.11	−0.287	.229	.035	− 0.55	14.56	47.97	.59	.03
	α^2 Libræ . . .	E.	9	44 45.97	−1.099	.125	.032	− 1.26	44.71	18.09	.62	.01
	β Ursæ Minoris	E.	9	51 32.34	+2.871	.634	.110	+ 2.13	34.47	7.66	. .	. .
	β Bootis. . .	E.	9	14 57 55.60	+0.058	− .273	− .037	− 0.25	55.35	28.71	.64	.01
	48 Cephei, S. P. .	E.	9	15 5 41.81	−5.307	+ .415	+ .123	4.77	37.04	10.06	. .	. .
	μ^1 Bootis. . .	E.	9	20 27.67	0.031	− .262	− .033	0.33	27.34	0.65	.69	.04
	ε Cor. Borealis.	E.	9	15 53 7.77	.296	.228	.024	0.55	7.22	40.58	.64	.03
	δ Ophiuchi . .	E.	9	16 8 34.96	0.877	.153	.019	1.05	33.91	7.21	.70	.02
	ζ Ophiuchi . .	E.	9	31 4.88	−1.000	.137	.016	1.15	3.73	37.06	.67	.02
	η Herculis . .	E.	9	39 17.27	+0.008	.267	.019	0.28	16.99	50.26	.73	.03
	κ Ophiuchi . .	E.	9	52 30.42	−0.648	.183	.013	0.84	29.58	2.95	.63	.07
	d Herculis . .	E.	9	57 41.08	−0.140	0.248	.014	− 0.40	40.68	13.95	26.73	.02
	ε Ursæ Minoris	E.	5	16 58 45.07	+6.606	−1.114	−0.089	+ 5.40	50.47	23.77	. .	. .
21	θ Bootis. . .	E.	8	14 21 37.44	+0.452	−0.338	−0.100	+ 0.01	37.45	9.73	27.72	.06
	ε^2 Bootis. . .	E.	9	40 16.12	−0.261	.234	.068	− 0.56	15.56	47.95	.61	.06
	α^2 Libræ . . .	E.	9	44 46.96	−1.000	.128	.062	− 1.19	45.77	18.08	.69	.02
	β Ursæ Minoris	E.	9	51 33.48	+2.611	.650	.227	+ 1.73	35.21	7.54	. .	. .
	β Bootis. . .	E.	9	14 57 56.71	+0.053	− .280	− .078	− 0.30	56.41	28.69	-.72	.05
	48 Cephei, S. P. .	E.	8	15 5 42.08	−4.826	+ .425	+ .268	4.13	37.95	10.24	. .	. .
	μ^1 Bootis. . .	E.	9	20 28.69	0.028	− .268	− .075	0.37	28.32	0.63	.69	.01
	α Cor. Borealis.	E.	9	30 7.93	.272	.233	.065	0.57	7.36	39.74	.62	.06
	α Serpentis . .	E.	9	38 53.49	.633	.181	.058	0.87	52.62	24.99	.63	.05
	ε Serpentis . .	E.	9	15 45 22.19	.665	.176	.057	0.90	21.29	53.66	.63	.05
	δ Ophiuchi . .	E.	9	16 8 35.87	−0.797	.157	.057	1.01	34.86	7.21	.65	.04
	τ Herculis . .	E.	8	16 39.26	+0.231	.305	.082	− 0.16	39.10	11.34	.76	.07
	η Draconis . .	E.	9	22 52.63	+0.975	.413	.118	+ 0.44	53.07	25.49	. .	. .
	ζ Ophiuchi . .	E.	9	31 5.84	−0.910	.141	.057	− 1.11	4.73	37.07	.66	.04
	η Herculis . .	E.	9	16 39 18.37	+0.007	−0.273	−0.071	− 0.34	18.03	50.25	−27.78	0.08

Observations and deduced Clock Corrections at the Naval Observatory—Continued.

Date.	Star.	Observer.	No. of Threads.	Mean Thread.	*Aa*	*Bb*	*Cc*	Instrumental Correction.	Corr. Transit.	Adopted Right Ascension.	Observed Clock Correct'n.	*v*
1880.				h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
July 2	β Bootis. . .	E.	9	14 57 59.38	+ 0.056	−0.290	−0.074	− 0.31	59.07	28.54	−30.53	0.04
	α Cor. Borealis.	E.	9	15 30 10.70	− .287	.242	.061	.59	10.11	39.65	.46	.04
	α Serpentis. .	E.	7	15 38 56.39	.666	.188	.053	0.91	55.48	24.94	.54	.03
	δ Ophiuchi. .	E.	9	16 8 38.73	.840	.163	.050	1.05	37.68	7.21	.47	.05
	κ Ophiuchi. .	E.	9	52 34.42	.621	.194	.048	0.86	33.56	2.98	.58	.05
	d Herculis . .	E.	9	57 44.98	− 0.135	0.264	.055	− 0.45	44.53	13.93	.60	.06
	ε Ursæ Minoris	E.	6	16 58 48.46	+ 6.328	1.184	.340	+ 4.80	53.26	22.74	. .	. .
	α¹ Herculis . .	E.	9	17 9 45.46	− 0.532	0.207	.046	− 0.78	44.68	14.20	.48	.06
	α Ophiuchi . .	E.	9	29 56.90	.566	.202	.045	0.81	56.09	25.57	.52	.03
	μ Herculis . .	E.	9	17 42 20.41	− 0.272	0.244	.048	− 0.56	19.85	49.27	−30.58	.03
	δ Ursæ Minoris	E.	7	18 11 26.47	+15.582	−2.502	−0.676	+12.40	38.87	8.35	. .	. .

The following adopted clock corrections and rates were obtained by the method of least squares from all the "observed clock corrections."

The corrections for personal equation given in the following table were derived from observations with the personal equation apparatus described in the Washington Observations for 1875. These observations were made each night during the time occupied in observing stars for clock corrections, and doubtless represent very nearly the absolute error of the observer. These determinations indicate that the observations were made *too late* by about $0^{s}.18$.

Adopted Clock Corrections at the Naval Observatory.

Day.	Sid. Hour.	Clock Correction.	Correction for Personal Equation.	Hourly Rate.
1880.	h.	s. s.	s.	s.
June 16	15.80	− 25.217 ± 0.008	+ 0.210	− 0.0065
17	15.80	25.760 ± 0.009	0.173	+ 0.0008
19	16.20	26.675 ± 0.007	0.164	− 0.0366
21	16.20	27.690 ± 0.011	0.165	0.0158
July 2	18.20	− 30.563 ± 0.011	+ 0.190	− 0.0203

THE WORK AT THE MORRISON OBSERVATORY.

Description of the instruments.—The Transit Circle of the Observatory was made by TROUGHTON & SIMMS, London, in 1876, and was mounted in 1877. The construction of the instrument and the method of mounting are quite similar to the instruments in use at Greenwich and the Harvard College Observatory.

The telescope has a clear aperture of 6 inches and a focal length of 6 feet 4 inches. The axis is cast in a single piece, into which fit the steel pivots 3.50 inches in diameter. The Ys are of gun-metal, and their bearing surfaces are 2.50 inches long 0.74 inch wide. The distance between the centers of the bearing surfaces is 3 feet 9 inches.

The piers are of iron, and are firmly bolted to heavy stone caps which rest upon brick foundations. The circles are 24 inches in diameter, divided to 5′, and read by four microscopes each.

The reticule in the focus of the telescope carries 15 vertical and 5 horizontal threads, the vertical threads being all carried by the right-ascension micrometer screw and the horizontal threads by the declination screw. There are no fixed threads in the field. The vertical threads are arranged in three tallies of five threads each, distinguished by the letters A, B, C, in the order of transit for lamp east. The separate threads are indicated by numeral subscripts. Only nine threads were used, and the following table gives the equatorial intervals from the middle thread. They have been determined by a large number of transits both of equatorial and circumpolar stars, using the observations of the same observer by whom the present time observations were made.

	s.	
s.	$B_1 = + 10.007$	s.
$A_4 = + 24.583$	$B_2 = + 5.996$	$C_1 = - 20.073$
$A_5 = + 20.069$	$B_3 =$ 0 000	$C_2 = - 24.673$
	$B_4 = - 6.003$	
	$B_5 = - 10.017$	

Collimators.—The Transit Circle is furnished with two collimators having object-glasses of 4 feet 3 inches focal length and 4.33 inches aperture. The distance between the bearing points of the collimator Ys is 3 feet 10 inches. In the focus of each collimator are fixed two close vertical threads (about 5″.3 apart) and one horizontal thread. In the ordinary time observations it is customary to observe for collimation immediately before the observations for time, and then set the micrometer so as to destroy the error in collimation. In the present observations two readings were obtained for collimation on each evening—one just before and one just after the observations for time, the mean of the two being used in reducing the observations.

The clock.—The standard sidereal clock of the Observatory (FRODSHAM No. 1369) was used in the time observations and the exchange of signals. It was mounted in June, 1877, and has been running for two years past on a very small and constant rate. Unfortunately, it stopped June 23, between the last two days of exchange. It was immediately taken down and cleaned, and resumed almost exactly the same rate on which it had been running before. An extra wheel on the main shaft of the clock, carrying 59 teeth, lifts a light spring and thereby breaks the circuit each second except the zero second.

The chronograph was made by ALVAN CLARK & SONS. Its barrel is 19 inches in circumference, and in the present observations both star transits and clock comparisons were read off to hundredths of a second.

Personal equation.—The relative personal equation of Professor EASTMAN and myself has been determined at various times during the last three years both with the machine invented by him and by independent determinations of clock corrections with the Meridian Circle of the Naval Observatory. For the present series of observations he kindly loaned one of his machines, and determinations of personal equation were made by me on each evening but one both before and after the exchange of signals. On June 19 only one series of observations was made. The principle of the machine and the method of observation is fully described in the Washington volume for 1875. The results of the different nights are shown in the following table. Observations were made over five wires, so that each set furnished five determinations of personal equation:

Date.	Sid. Time.	No. Sets.	Per. Eq.
1880.	h.		s.
June 16	13.9	6	— 0.218
16	16.9	6	— 0.210
17	13.9	7	— 0.177
17	16.1	6	— 0.168
19	16.9	9	— 0.164
21	14.2	6	— 0.155
21	16.2	6	— 0.153
July 2	15.5	3	— 0.163
2	18.2	7	— 0.167

These values are quite in accord with determinations of personal equation made during 1878–'79, when I was one of the regular observers on the Meridian Circle of the Naval Observatory.

Determination of instrumental constants.—The collimation constant was determined from the collimators, as indicated above, and the level constant from mercury, using a collimating eye-piece, which necessitated the removal of the ordinary eye-piece whenever an observation for level is made. Two observations of collimation and two of level were made on each evening, and the mean of the two used as the correction for the evening.

The azimuth constant was determined by least squares from all the stars.

In the following table, a, b, and c denote, respectively, the azimuth, level, and collimation constants:

Date.	a	b	c
1880.	s.	s	s.
June 16	+ 0.340	+ 0.377	0.000
17	.465	.363	— 0.005
19	.385	.381	0.000
21	.392	.341	+ 0.003
July 2	+ 0.333	+ 0.371	0.000

On June 16 the azimuth constant, clock correction, and rate were determined directly from the observations by the method of least squares. On the other dates a series of equations of condition was formed, involving as unknown quantities azimuth constant and clock error. The azimuth thus determined was used for obtaining the individual clock corrections from the different stars. The circumpolar stars were then thrown out and another solution by least squares was made for rate and clock correction at the epoch of exchange.

On June 16 a power of 100 was used, on the other dates a power of 170. The time stars of the American Ephemeris were used with **Newcomb**'s right ascensions. In the original programme it was intended to use no stars brighter than the third magnitude, but on account of clouds this programme had to be modified on several nights. On several occasions stars as bright as the second magnitude were used, but the clock corrections from these stars show no systematic differences from the others. Hence they have been retained.

In the following table the times given under the column "Observed Time" have been reduced to the middle thread and corrected for the daily aberration. In the column "*v*" are the residuals obtained after introducing the clock correction and rate into the equations of condition:

Date.	Star.	No. of Threads.	Observed Time.	*Aa*	*Bb*	*Cc*	Instrumental Correction.	Corrected Time.	Adopted Right Ascension.	Observed Clock Correction.	*v*
1880.			h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
June 16	12 Canum Venat.	9	12 51.22.78	+0.002	+0.485	0.000	+0.49	23.27	27.57	−55.70	+0.01
	ϑ Virginis	9	13 4 42.36	.237	.271	.000	.51	42.87	47.18	.69	.00
	ζ Virginis	9	29 32.94	+ .215	.292	.000	.51	33.45	37.78	.67	− .02
	η Ursæ Majoris	9	44 46.89	− .097	.575	.000	.48	47.37	51.68	.69	.00
	η Bootis	9	13 49 56.51	+ .124	.374	.000	.50	57.01	1.31	.70	+ .01
	β Libræ	9	15 11 31.89	.256	.254	.000	.51	32.40	36.67	.73	.03
	α Cor. Borealis	9	30 35.01	.080	.414	.000	.49	35.50	39.77	.73	+ .03
	α Serpentis	9	39 20.14	.183	.320	.000	.50	20.64	24.99	.65	− .05
	ε Serpentis	9	45 48.86	.192	.312	.000	.50	49.36	53.66	.70	.00
	ε Cor. Borealis	9	15 53 35.77	.080	.415	.000	.50	36.27	50.59	.68	− .03
	δ Ophiuchi	9	16 9 2.43	+0.230	+0.278	0.000	+0.51	2.94	7.21	−55.73	+0.02
June 17	12 Canum Venat.	9	12 51 22.77	+0.003	+0.471	−0.007	+0.47	23.24	27.55	−55.69	0.00
	ϑ Virginis	9	13 4 42.28	.310	.261	.004	.57	42.85	47.17	.68	− .01
	ζ Virginis	9	29 32.93	+ .280	.281	.004	.56	33.49	37.78	.71	+ .02
	η Ursæ Majoris	9	43 46.88	− .127	.554	.007	.42	47.30	51.66	.64	− .05
	η Bootis	9	13 49 56.44	+ .162	.360	.005	.52	56.96	1.30	.66	− .03
	β Bootis	9	14 58 24.05	− .016	.480	.006	.46	24.51	28.73	.78	+ .08
	β Libræ	9	15 11 31.81	+ .334	.245	.005	.57	32.38	36.67	.71	.01
	μ^1 Bootis	9	20 55.93	.015	.459	.006	.47	56.40	0.68	.72	+ .02
	α Cor. Borealis	9	30 34.97	.105	.398	.006	.50	35.47	39.76	.71	.00
	α Serpentis	9	39 20.14	.240	.308	.005	.54	20.68	24.99	.69	− .02
	ε Serpentis	9	45 48.81	.252	.301	.005	.55	49.36	53.66	.70	.01
	ε Cor. Borealis	9	15 53 35.78	.100	.399	.006	.49	36.27	40.59	.68	− .03
	δ Ophiuchi	7	16 8 2.38	+0.300	0.268	.005	+0.56	2.94	7.21	.73	+ .02
	ε Ursæ Minoris	5	16 59 19.76	−2.232	+1.966	−0.037	−0.30	19.46	23.77	−55.69	. .

Table—Continued.

Date.	Star.	No. of Threads.	Observed Time.	Aa	Bb	Cc	Instrumental Correction.	Corrected Time.	Adopted Right Ascension.	Observed Clock Correction.	v
1880.			h. m. s.	s.	s.	s.	s.	s.	s.	s.	s.
June 19	α Bootis . . .	9	14 11 9.64	+0.136	+0.382	0.000	+0.52	10.16	14.35	−55.81	−0.02
	ϑ Bootis . . .	9	22 5.13	− .143	0.608	.000	.46	5.59	9.77	.82	− .01
	5 Ursæ Minoris .	7	28 46.81	− .972	1.278	.000	.31	47.12	51.25	. .	. .
	α² Libræ	9	14 45 13.42	+ .326	0.228	.000	.55	13.97	18.09	.88	+ .05
	α Cor. Borealis .	9	15 30 35.09	.091	.418	.000	.51	35.60	39.75	.85	+ .02
	α Serpentis . . .	9	39 20.27	.208	.323	.000	.53	20.80	24.99	.81	− .02
	ε Serpentis . . .	9	45 48.94	+0.219	0.315	.000	.53	49.47	53.66	.81	− .02
	ζ Ursæ Minoris .	5	49 21.96	−1.178	1.445	.000	.26	22.22	26.46	. .	. .
	ε Cor. Borealis .	9	15 53 35.84	+0.090	0.419	.000	.51	36.35	40.59	.76	− .08
	δ Ophiuchi . . .	9	16 9 2.52	.261	.281	.000	.54	3.06	7.21	.85	+ .01
	ζ Ophiuchi . . .	9	31 32.35	.298	.251	.000	.55	32.90	37.06	.84	.00
	η Herculis . . .	7	39 45.66	+0.001	0.491	.000	.49	46.15	50.27	−55.88	+0.04
	ε Ursæ Minoris .	9	16 59 19.49	−1.941	+2.063	0.000	+0.12	19.61	23.76	. .	. .
June 21	ϑ Virginis . . .	9	13 4 42.55	+0.274	+0.246	+0.003	+0.52	43.07	47.13	−55.94	−0.01
	ζ Virginis . . .	9	29 33.18	.248	.264	.003	.52	33.70	37.74	.96	+ .01
	η Bootis . . .	9	13 49 56.74	+ .143	.338	.003	.48	57.22	1.26	.96	+ .01
	α Draconis . . .	9	14 2 7.08	− .401	.726	.007	.33	7.41	11.48	. .	. .
	θ Bootis . . .	5	14 22 5.28	− .145	.544	.005	.40	5.68	9.73	.95	.00
	α Cor. Borealis .	7	15 30 35.24	+ .093	.374	.003	.47	35.71	39.74	.97	+ .02
	α Serpentis . . .	9	39 20.43	.212	.290	.003	.51	20.94	24.98	.96	+ .01
	ε Serpentis . . .	9	15 45 49.09	.223	.282	.003	.51	49.60	53.66	.94	− .01
	δ Ophiuchi . . .	9	16 9 2.64	+ .266	.251	.003	.52	3.16	7.21	.95	.01
	τ Herculis . . .	7	17 6.82	− .073	.492	.004	.42	7.24	11.33	.91	− .05
	ζ Ophiuchi . . .	9	31 32.53	+ .303	.225	.003	.53	33.06	37.07	.99	+ .03
	η Herculis . . .	9	39 45.77	.001	.440	.003	.44	46.21	50.26	.95	− .01
	κ Ophiuchi . . .	9	52 58.42	+0.197	0.300	.003	+ .50	58.92	2.95	−55.97	+0.01
	ε Ursæ Minoris .	7	16 59 19.69	−1.976	+1.847	+0.022	−0.11	19.57	23.63	. .	. .
July 2	ϑ Bootis . . .	9	14 21 8.74	−0.124	+0.592	0.000	+0.47	9.21	9.47	+ 0.26	+0.02
	5 Ursæ Minoris .	9	27 49.59	− .840	1.245	.000	.40	49.99	50.25	. .	. .
	ε Bootis . . .	9	39 47.06	+ .076	0.410	.000	.49	47.55	47.83	.28	− .01
	α² Libræ	9	44 17.26	+ .283	0.222	.000	.50	17.76	18.01	.25	+ .02
	β Ursæ Minoris .	9	51 6.16	− .728	1.142	.000	.41	6.57	6.82	. .	. .
	β Bootis . . .	9	14 57 27.76	− .014	0.490	.000	.48	28.24	28.54	.30	− .03
	β Libræ	9	15 10 35.85	+ .251	.250	.000	.50	36.35	36.62	.27	.00
	μ¹ Bootis . . .	9	19 59.72	.012	.469	.000	.48	0.20	0.51	.31	− .04
	ε Serpentis . . .	5	15 44 52.89	.189	.307	.000	.50	53.39	53.62	.23	+ .04
	μ Herculis . . .	9	17 41 48.51	+ .075	.411	.000	.49	49.00	49.26	.26	+ .01
	γ Draconis . . .	9	17 53 51.72	− .113	.582	.000	.47	52.19	52.52	.33	− .06
	η Serpentis . . .	9	18 15 9.32	+ .224	.275	.000	.50	9.82	10.06	.24	+ .03
	1 Aquilæ . . .	9	18 28 44.04	+0.248	+0.253	0.000	+0.50	44.54	44.79	+ 0.25	+0.02

The solution by least squares in the manner indicated above affords the following values of the clock correction and rate on the different dates:

Date.	Glasgow Sid. Time.	Clock Correction.	Probable Error.	Hourly Rate.
1880.	h.	s.	s.	s.
June 16	15.0	− 55.6976	± 0.0091	− 0.00879
17	14.6	55.6998	.0066	.00654
19	15.0	55.8345	.0105	.00652
21	15.0	− 55.9536	.0042	.00164
July 2	16.8	+ 0.2705	± 0.0106	− 0.00203

On each night clock-beats were sent for three minutes each way. The signals sent from Washington to Glasgow give the following comparisons of clocks. The last column gives the number of separate comparisons read off from the sheet:

Washington to Glasgow.

Date.	Frodsham 1369.			Kessels 1324.			No. of Comp.
1880.	h.	m.	s.	h.	m.	s.	
June 16	15	2	54.8535	16	5	30.0	60
17	14	35	26.3208	15	38	2.0	76
19	15	2	53.5235	16	5	30.0	94
21	15	2	52.6637	16	5	30.0	103
July 2	16	46	3.4999	17	49	40.0	70

For the use of the wires between Washington and Glasgow we are especially indebted to Mr. W. K. Morley, superintendent of the telegraph line on the Western Division of the Chicago and Alton road. We are also indebted to Mr. H. K. Waters and William Wickes for their services as operators.

HENRY S. PRITCHETT,
Astronomer Morrison Observatory.

WASHINGTON RECORD OF SIGNALS.

The record of *twenty* clock signals from Glasgow were read from the chronograph sheets for comparison on each night, and the mean of each set is given below. The Glasgow record of observations and signals was compared with the *odd-seconds* record of the clock on the Glasgow chronograph, and accordingly only the *odd-seconds* record of the Glasgow clock on the Washington chronograph was used in the comparison of signals.

Mean of clock signals from Glasgow to Washington.

WASHINGTON RECORD.

Date.	Number of Signals.	Glasgow Clock.			Washington Clock.		
1880.		h.	m.	s.	h.	m.	s.
June 16	20	14	45	28.000	15	44	3.600
17	20	14	42	6.368	15	44	42.508
19	20	15	12	40.000	16	15	16.864
21	20	15	10	44.000	16	13	21.804
July 2	20	17	10	6.895	18	13	43.852

TELEGRAPH LINES, REPEATERS, AND BATTERIES.

On June 16, 19, 21, and July 2, repeaters were employed at Pittsburgh, Indianapolis, and Saint Louis. On June 17 the circuit through Philadelphia was used, and repeaters were employed at Harrisburg, Pittsburgh, Indianapolis, and Saint Louis.

At Washington, and at all the repeating stations, the batteries employed were the *gravity* batteries in general use by the Western Union Telegraph Company. The average number of cells employed each night at the several stations was 100, except on June 19, when 225 cells were used at the Washington office, 140 at Pittsburgh, 150 at Indianapolis, and 125 at Saint Louis.

The length of telegraph wire used is as follows:

Washington to Pittsburgh, via Philadelphia and Harrisburg - - - -	490 miles.
Washington to Pittsburgh direct - - - - - - - - - - - - - - -	343 miles.
Pittsburgh to Indianapolis - - - - - - - - - - - - - - - - - -	374 miles.
Indianapolis to Saint Louis - - - - - - - - - - - - - - - - -	239 miles.
Saint Louis to Glasgow - - - - - - - - - - - - - - - - - - -	184 miles.

Table showing the comparison of Signals, the applied Clock Corrections, and the deduced Longitude on each night.

Date.	Signals from Glasgow to Washington.		Signals from Washington to Glasgow.		Difference of Longitude from Signals G to W.	Difference of Longitude from Signals W to G.	Mean Difference of Longitude.	Wave and Armature Time.
	Glasgow Clock.	Washington Clock.	Glasgow Clock.	Washington Clock.				
1880.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	s.
June 16	14 45 28.000	15 48 3.600	15 2 54.854	16 5 30.000				
	− 55.482	− 25.207	− 55.484	− 25.009				
	14 44 32.518	15 47 38.593	15 1 59.370	16 5 4.991	1 3 6.075	1 3 5.621	1 3 5.848	0.227
June 17	14 42 6.368	15 44 42.508	14 35 26.321	15 38 2.000				
	− 55.529	− 25.587	− 55.528	− 25.587				
	14 41 10.839	15 44 16.921	14 34 30.793	15 37 36.413	1 3 6.082	1 3 5.620	1 3 5.851	0.231
June 19	15 12 40.000	16 15 16.864	15 2 53.524	16 5 30.000				
	− 55.671	− 26.513	− 55.670	− 26.507				
	15 11 44.329	16 14 50.351	15 1 57.854	16 5 3.493	1 3 6.022	1 3 5.639	1 3 5.830	0.191
June 21	15 10 44.000	16 13 21.804	15 2 52.664	16 5 30.000				
	− 55.800	− 27.525	− 55.800	− 27.523				
	15 9 48.200	16 12 54.279	15 1 56.864	16 5 2.477	1 3 6.079	1 3 5.613	1 3 5.846	0.233
July 2	17 10 6.895	18 13 43.852	16 46 3.500	17 49 40.000				
	+ 0.434	− 30.374	+ 0.435	− 30.365				
	17 10 7.329	18 13 13.478	16 46 3.935	17 49 9.635	1 3 6.149	1 3 5.700	1 3 5.924	0.224
						Mean .	1 3 5.860	0.221

The Transit Circle of this Observatory is 0^s.066 west of the central or old dome, from which all longitudes are reckoned. Applying this correction to the mean value of the determinations above, we have the Transit Circle of the Morrison Observatory at Glasgow, Mo.,

$$1^h\ 3^m\ 5^s\!.926$$

west of the the central dome of the United States Naval Observatory.

My thanks are due Mr. M. Marean, of the Western Union Telegraph Office, of Washington, for his skillful management of the telegraph lines in the exchange of signals and messages.

Very respectfully,

J. R. EASTMAN,
Professor Mathematics, U. S. N.

Rear-Admiral John Rodgers, U. S. N.,
Superintendent United States Naval Observatory.

APPENDIX VI.

OBSERVATIONS
OF
DOUBLE STARS
MADE AT THE
UNITED STATES NAVAL OBSERVATORY,

BY

ASAPH HALL,
PROFESSOR OF MATHEMATICS, UNITED STATES NAVY.

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INTRODUCTION.

§ 1.

My regular observations with the 26-inch Refractor of the Naval Observatory were begun in the spring of 1875, the instrument at that time being in charge of Professor Simon Newcomb. Professor Newcomb gradually withdrew from observing with this instrument, which came under my direction sometime in July of the same year. The micrometrical measurements which had been made by Professors Newcomb and Holden were chiefly of the satellites of Uranus and Neptune, and the discussion of these measurements of the two outer satellites of Uranus brought out very clearly what had been indicated before by Von Asten; viz, the existence of a large constant difference in the angles of position measured by Mr. Otto Struve, director of the Imperial Observatory at Pulkowa. As it is our intention to repeat the measurements of the satellites of Uranus and Neptune after a few years, and as it seemed probable that similar differences might exist in the observations of double stars, it occurred to me that the best way of comparing and uniting the observations of different astronomers would be for each one to observe the same double stars at nearly the same time. I wrote to Struve proposing that this should be done, and that he should select the list of stars. In reply he informed me that such a series of observations was already in progress between himself and Baron Dembowski, and after adding to the list of stars a few of greater distances this list and an account of the proposed work were published by Struve in the "Vierteljahrsschrift der Astronomischen Gesellschaft." Band xi, p. 227.*

It was understood that each observer should avoid all knowledge of the observations of other astronomers, in order that his work might be done independently, and in my own case this rule has been carefully adhered to. But now nearly four years have elapsed since Struve's publication, and it is probable that all the astronomers engaged in this work have collected such a number of observations that the publication of my own results will not influence the independence of theirs. Moreover, the end of the year 1879 seems to be a favorable epoch for publishing my observations of double stars made before 1880, since I hope to make some changes which in the future will enable me to observe under conditions more favorable to accuracy.

I have therefore collected and revised all my observations of double stars, and the results are given in the following pages. In order to make this collection complete I have included the few observations made in the year 1863 with the equatorial of 9.6 inches aperture. The whole number of observations is 1614.

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* Mittheilung über unternommene Beobachtungsreihen zur Vergleichung von Mikrometermessungen. 1876, Anfang Juni. Otto Struve.

§ 2.

It will not be necessary to give any general description of the 26-inch Refractor made by ALVAN CLARK and SONS for the Naval Observatory, since such descriptions can be found in the annual volumes of the Observatory for 1873 and 1874. It will be sufficient to refer here only to those matters which are more closely connected with the micrometrical measurements.

The form of the mounting adopted by the makers for this Equatorial is such that the instrument, notwithstanding its great size, is handled with ease; and the harp-shaped piece that supports the polar axis is very convenient when observing near the zenith. Generally the instrument is pointed on a star by means of what are called the "rough circles." These circles are the edges of the hour and declination circles, which were painted white, and then divided by lines of black paint, the hour circle into spaces of ten minutes of time and the declination circle into degrees. This method of pointing is usually accurate enough to find the object, but as the painting was not well done errors as great as 15′ to 20′ could be made in some parts of the rough declination circle. An accurate reading for the position could be made by means of the finely divided circles, but this involves considerable time and trouble. On account of the delay in the observations which would be caused in making the change, and of the natural inertia in getting rid of a poor thing to which one has become accustomed, this defective circle for the declination was used until June, 1879, when the circle was painted white and divided again under the care of Mr. GARDNER, the instrument-maker of the Observatory. The settings are now much more accurate and give but little trouble, and the saving of time is very great. It is possible that a few cases may be found where, on account of an erroneous setting in declination, I have observed a different object from the one supposed.

The ease and rapidity with which observations can be made with a filar micrometer depend largely on the performance of the driving-clock. The accuracy of the observations also is in a measure dependent on this performance, but patience and skill on the part of the observer will in a good degree make up for a poor performance of the clock. The motive power of our driving-clock comes from a small water-wheel which is driven by water drawn from the Potomac water pipes. At first the water was applied directly to the conical pendulum, but the pressure of the water was so variable that weights attached to an endless cord, (Huygen's loop), were placed between the water-wheel and the pendulum by Professor NEWCOMB. When this had been done the performance of the clock is said to have been tolerable; but in the autumn of 1875 it became very troublesome, and the observer was frequently annoyed by the stopping of the clock. This trouble continued and became worse until July, 1876, when the clock was dismounted by Mr. GARDNER and myself. The lower end of the shaft of the conical pendulum had been given a conical shape, and had rested in a conical cup. The friction and heat had been so great that the lower end of this shaft had become very rough and twisted to a gimlet shape, thus stopping the clock. The bearing of the shaft was changed and made of a plane agate surface, the lower end of the shaft being rounded to a slightly curved surface. The friction of the upright shaft of the water-wheel was also diminished by clamping a set of friction wheels to this shaft and letting them play on a horizontal iron surface. The weights on the Huygen's loop were changed for cups carrying shot. With an average pressure of the water, and the machinery well oiled, these weights are 7½ and 3½ pounds, but the weights can be varied to suit the resistance and the pressure by changing the shot. Since these changes the performance of the clock has been tolerably good. Still this clock needs much care, and being dependent on an unsteady pressure of water a delay in the observations sometimes occurs. The great length of the telescope, which exposes it to the action of the wind, is also a hinderance to the steady driving of the clock.

The difficulty in turning the dome, of about 42 feet diameter, has increased. This difficulty is caused probably by the uneven settling of the supporting walls, and the bulging of the dome in the direction of the slit. The labor of turning the dome through a revolution is so great that lists of north and south objects are prepared beforehand by the observer in order to avoid as much as possible the turning of the dome.

The position of the pole of the instrument has been found by observing Polaris and two equatorial stars, each star being observed in both positions of the instrument. At first the readings of the finely-divided circles were so confused that nothing could be derived from the observations, but this trouble was remedied by engraving on the verniers of the declination circle small arrows that indicate the direction in which the readings must be made, and painting on the holders of the microscopes similar arrows. The declination circle reads to $0'.2$ by means of the verniers, and the hour circle to a second of time by means of the microscopes, and by estimation to a tenth of a second By clamping the instrument in declination and then moving it to different hour angles, I found that the looseness of the instrument in its mountings might cause a small error in the observed declination, the maximum error amounting to $\pm 0'.2$. This looseness seems necessary for so large an instrument, in order to insure ease of motion with varying temperatures, and the error is so small that it has been neglected. If we denote by i the angle between the declination axis and the plane of the hour circle, and by c the collimation error of the telescope, or the difference from a right angle of the angle between the axis of the telescope and the declination axis, I find from the observations of December 13, 1876, and of January 9, 1877, the values

$$i = -0'.14; \qquad c = +0'.15.$$

These quantities should be small in a well-constructed equatorial, and such is seen to be the case with our instrument. If λ be the distance of the pole of the instrument from the pole of the heavens, and h its hour angle, the observations have given the following results:

Date.	λ.	h.
1876, December 13,	1'.62	169°.88
1877, January 9,	1 .63	170 .30
1878, January 3,	1 .42	160 .67
1879, May 22,	1 .66	147 .27
1880, January 29,	1 .65	139 .95
1880, January 31,	1 .82	136 .38

If τ be the hour angle of the object and δ its declination, the correction to an observed angle of position will be

$$\lambda \sin (\tau - h) \text{ sec. } \delta.$$

In all of my observations this correction is insensible. Moreover, I have generally determined the zero of the position circle in the part of the heavens where the observations were made. The values of λ show that the distance of the pole of the instrument from the pole of the heavens has remained nearly constant. The changes in the values of h are of little importance, but they might be anticipated, I think, from the form of the pier and the mounting, apparently too slender in the direction perpendicular to the meridian.

Our observations have shown no sensible flexure of the tube, and the micrometrical measurements are independent of such an error. It is interesting, however, to know the flexure of a tube like this, made of thin sheet steel and 31 feet long. The north-polar distances of the following stars were observed near the time of their culmination, each star being observed in both positions of the telescope, and after applying the corrections for refraction the instrumental positions of the stars were as follows:

1880, April 17: Ther. 62°.0 F.

	N. P. D.	
	°	′
15 Argus - - - - - -	113	59.67
ε Hydræ - - - - -	83	10.35
ι Ursæ Majoris - - -	41	31.12
κ Cancri - - - - -	78	52.86
α Hydræ - - - - -	98	10.64
μ Leonis - - - - -	63	27.63
32 Ursæ Majoris - - -	24	19.46
9 Draconis - - - -	13	41.92
226 Cephei, S. P. - - -	345	38.00

Denoting by z the zenith distance of the star, and by ε the flexure of the telescope, the equation for the flexure is of the form

$$\xi + \sin z \,.\, \varepsilon + n = 0.$$

Comparing the observed positions with the known we have the following equations of condition:

Equations.	Residuals.
°	′
$\xi + 0.8902\ \varepsilon + 1.82 = 0$	$-$ 0.02
$\xi + 0.5156\ \varepsilon + 1.66 = 0$	$-$ 0.16
$\xi - 0.1670\ \varepsilon + 1.84 = 0$	+ 0.06
$\xi + 0.4656\ \varepsilon + 1.71 = 0$	$-$ 0.11
$\xi + 0.7319\ \varepsilon + 2.00 = 0$	+ 0.16
$\xi + 0.2136\ \varepsilon + 1.79 = 0$	$-$ 0.01
$\xi - 0.4510\ \varepsilon + 1.85 = 0$	+ 0.09
$\xi - 0.5216\ \varepsilon + 1.77 = 0$	+ 0.01
$\xi - 0.9190\ \varepsilon + 1.63 = 0$	$-$ 0.10

The normal equations are

$$\begin{aligned} +9\,\xi + 0.7673\,\varepsilon + 16.07 &= 0 \\ + 3.1878\,\varepsilon + 1.57 &= 0 \end{aligned}$$

and hence

$$\xi = -1'.79 \pm 0'.025; \qquad \varepsilon = -0'.064 \pm 0.'043.$$

The flexure coefficient is therefore insensible.

§ 3.

The filar micrometer with which the following observations have been made is the one originally furnished by the makers. The screw of this micrometer has been examined by Professors NEWCOMB and HOLDEN, and by myself, and has proved to be excellent. A very complete investigation of the value of a single revolution of the screw has been made by Professor HOLDEN, who has determined this value by several independent methods. His adopted value of a single revolution is

$$R = 9''.9479.$$

The value of a revolution is the same throughout the part in use, and there appears to be no sensible term depending on the temperature. I have used the above value in all my reductions.

In this micrometer the additional screw, which in the Fraunhofer micrometer moves what is called the "fixed wire," is placed outside the micrometer box, and is a common screw which moves the entire micrometer plate without altering the relation between the wires. This arrangement is convenient for enabling one to make a deliberate measure of the distance; and it also gives the means of partially counteracting an incorrect motion of the driving-clock. On the other hand, in this micrometer the fixed wire always remains at a certain point, or the coincidence of the wires has a constant reading, which is about $64^{r}\,1$. If therefore there is a periodical error of the screw, or any peculiarity pertaining to a certain part of it, the result of a large number of accurate measurements of a given distance will be to establish this distance with a small probable error, but affected with an unknown constant error. A continual shifting of the coincidence of the wires, as in the micrometer used by Professor BRÜNNOW at the Dunsink Observatory, is perhaps the best method of avoiding the periodical errors of a screw. In such a micrometer the individual measures will be more discordant, but the mean result will be more trustworthy. In our micrometer therefore the periodical errors need to be carefully examined. An examination of these errors was made by Professor NEWCOMB in 1874, by means of Professor HARKNESS's Measuring Engine; and a statement of the result of this work is given in the annual volume of the Naval Observatory for 1874, p. LXX of the Introduction. This examination was repeated by Professor HOLDEN in 1876, who found likewise that the periodical errors were insensible. In order to leave no doubt on this point I have again repeated this examination.

The micrometer of the Equatorial was placed under the Harkness Measuring Engine on May 6 and May 7, 1880, and the distance corresponding to each one-tenth of a revolution of the screw was measured by means of the micrometer belonging to the engine. These measures were made at a temperature of 79°. They were extended over the ten revolutions, from 59^r to 69^r; and generally each result depends on three settings of the engine-micrometer, but in a few cases on six settings. The following table gives the results of these measures, which are corrected for errors in the scale of the engine:

	Δ		Δ		Δ		Δ		Δ
r. 59.0	0.644	r. 60.0	0.621	r. 61.0	0.622	r. 62.0	0.617	r. 63.0	0.628
.1	0.597	.1	0.622	.1	0.625	.1	0.620	.1	0.618
.2	0.631	.2	0.611	.2	0.619	.2	0.640	.2	0.620
.3	0.635	.3	0.634	.3	0.630	.3	0.583	.3	0.619
.4	0.612	.4	0.604	.4	0.627	.4	0.634	.4	0.632
.5	0.637	.5	0.639	.5	0.610	.5	0.622	.5	0.615
.6	0.613	.6	0.620	.6	0.618	.6	0.628	.6	0.611
.7	0.612	.7	0.619	.7	0.604	.7	0.622	.7	0.630
.8	0.632	.8	0.618	.8	0.621	.8	0.610	.8	0.622
59.9	0.611	60.9	0.626	61.9	0.620	62.9	0.629	63.9	0.630

	Δ		Δ		Δ		Δ		Δ
r. 64.0	0.628	r. 65.0	0.605	r. 66.0	0.595	r. 67.0	0.645	r. 68.0	0.616
.1	0.629	.1	0.629	.1	0.636	.1	0.628	.1	0.625
.2	0.601	.2	0.614	.2	0.630	.2	0.615	.2	0.601
.3	0.645	.3	0.616	.3	0.607	.3	0.614	.3	0.629
.4	0.606	.4	0.618	.4	0.627	.4	0.616	.4	0.625
.5	0.621	.5	0.614	.5	0.617	.5	0.631	.5	0.621
.6	0.620	.6	0.638	.6	0.630	.6	0.609	.6	0.639
.7	0.623	.7	0.610	.7	0.618	.7	0.606	.7	0.606
.8	0.627	.8	0.629	.8	0.597	.8	0.630	.8	0.603
64.9	0.623	65.9	0.625	66.9	0.643	67.9	0.638	68.9	0.640

Taking the means for each tenth of a revolution, we have

Micr.	Δ	Residuals.
r	d.	
0.0 to 0.1	0.6221	+ 9
0.1 0.2	0.6229	+ 17
0.2 0.3	0.6182	− 30
0.3 0.4	0.6212	0
0.4 0.5	0.6201	− 11
0.5 0.6	0.6227	+ 15
0.6 0.7	0.6226	+ 14
0.7 0.8	0.6150	− 62
0.8 0.9	0.6189	− 23
0.9 0.0	0.6285	+ 73
Mean: Δ = 0.6212 = 0''.995		

The probable error of a single set of three pointings is, if we neglect the periodical terms,

$$\pm 0^{d}.00804 ; \text{ or in arc } \pm 0''.0129$$

If, now, we compute the probable error of such a set from the residuals of the single pointings I find it to be $\pm 0''.0045$. This result shows that the largest part of the probable error has come from disturbance of the micrometer wire, or peculiarities that belong to each setting. The plate of the micrometer was fastened down with beeswax, and great care was taken in moving the wire, but some disturbance is indicated by the values of $\varDelta$.

Denoting the correction of the reading of the head of the micrometer by $\varphi(u)$, where u is the angular value of this reading, and assuming that the residuals have a periodical form, we have

$$\varphi(u) = +0''.0002 \sin u + 0''.0022 \cos u - 0''.0022 \sin 2u + 0''.0047 \cos 2u$$

This correction can generally be neglected, and this screw appears to be practically free of periodical errors.

It remains to determine the effect of changes of temperature on the screw, and this can be done best by observing the difference of declination of two stars near the north pole, where they can be observed in summer and in winter. Hitherto this correction has been assumed to be insensible.

The wires of the micrometer have been broken or removed several times, generally in changing the eye-pieces in cold weather, or on account of small spiders getting on them, but they have been restored by Mr. Gardner with webs from the same cocoon. These wires are soaked in warm water, and then stretched to about three times their natural length before they are inserted. They have given but little trouble by sagging or catching on each other. The thickness of the wires is nearly 0''.2.

The wires are illuminated with a red light, which is obtained from a lamp held by an assistant. This light enters the micrometer box through a hole at one end of it, and although the light is thus on one side, the wires always appear round and sharp, and there is very little stray light reflected into the field. In this rather primitive method of illumination a skillful and practised assistant can graduate the amount of light to suit the faintest object. There is also a method provided for illuminating the field, and a few of the observations have been made with this illumination, but nearly all have been made with bright wires in a dark field, and the other cases will be specially mentioned.

The eye-pieces that I have used in my measures are achromatic. These eye-pieces are made after Steinheil's formula, and consist of two lenses, each lens being composed of two glasses cemented together, the flint glasses being outside. In our observing books these lenses are designated as 400 A, 600 A, and 800 A. A power of 1282 has been used on a few occasions and is called 1300. The following is a list of these eye-pieces:

Name.	Maker.	Power.
400 A	Kahler . .	383
600 A	Kahler . .	606
800 A	Steinheil. .	888
1300	Kahler . .	1282

The magnifying powers have been determined by means of a dynameter. A few of my earlier observations were made with a non-achromatic eye-piece, giving a power of 392.

The position-circle is 7¼ inches in diameter, and is divided to two-tenths of a degree. It is provided with two verniers, which may be read to a hundredth of a degree, but in observing double stars the circle is read by one vernier and to a tenth of a degree only. There is no eccentricity of this circle that is sensible in these observations. The zero of the circle is determined by turning the wires until a 7th to 9th magnitude star exactly follows the wire through the field; or by setting the circle approximately correct and bisecting the star near its entrance into the field and near its exit, and then by means of the interval of time and the readings of the micrometer computing the correction to the assumed setting.

§ 4.

After some practice, and on becoming familiar with the instrument and micrometer, my manner of observing a double star has been as follows: In order to measure the angle of position the two wires are separated a convenient distance and the stars are placed between them. The position-circle is turned by the hand until both stars appear midway between the wires, and then the circle is read. The light having been taken out of the micrometer, the wires are turned thirty or forty degrees forward and backward several times before the light is thrown on the wires again for the purpose of making the settings of the circle as independent as possible, and another reading is made. Generally four readings of the position-circle are taken. Then this circle is turned 90° from the mean of the readings and the double distance is measured. First the stars are bisected by the wires and the micrometer is read; then the wires are reversed and the stars are bisected again. The wires are then restored to their original position and another double distance is measured. Two such distances are generally observed. An estimated value of the angle of position is always recorded, as well as the sidereal time of the observation, and also an estimate of the weight of the observation. This weight depends simply on the condition of the images of the stars, and the numbers **1** to **5** are used for expressing the weights; **1** denoting a very poor condition of the images, **3** an average condition, and **5** a perfect condition. I have very rarely observed double stars when the images were so poor as to be given the weight **1**. As far as possible I have avoided all knowledge of the angles and distances observed by other astronomers. In my observing-list these quantities are omitted, and no comparison with other observations is made until my own observations of a star are completed. It is possible, therefore, that in some cases my angles may differ by a multiple of a quadrant from those observed elsewhere.

I have omitted observations of color and of magnitude. These observations have now become a specialty, and such observations as I could make would not do much more perhaps than tend to introduce confusion. In the case of stars observed by the STRUVES, to which most of my observations belong, I have adopted their magnitudes. In most cases these magnitudes are brighter than those of the scale to which I have been accustomed; thus what the STRUVES would call a 7th or 8th magnitude I would call an 8th or a 9th.

Very few of the observations have been made in the twilight, which offers the best conditions for observing double stars, since, the observer residing at a distance from the observatory, it has not been convenient to do this.

With such a large objective great changes occur in the appearance of the stars during a single night. Generally so long as rapid changes of temperature are going on the performance of the object-glass is not good. But on a few nights of the year, when all the atmospheric conditions are favorable, the performance of the glass is excellent, and its separating power is all that could be desired. Usually ruddy and reddish stars are the most difficult to observe, a result which may be caused by the figure of the objective. After having been in use two years the form of the lenses seemed to have undergone a slight change, and in the beginning of May, 1876, the surfaces of the flint lens were refigured by Mr. ALVAN CLARK and his son, Mr. ALVAN G. CLARK. This is the only change that has been made in the objective. On a single occasion water collected between the lenses, and they were taken out, cleaned by Mr. GARDNER, and returned to their cell with very little trouble.

Until March, 1878, all the observations were made with my left eye; but having used my eyes very much during the preceding year, and having done a good deal of computing by gaslight, my eyes became weakened. In March, 1878, while observing the stars in the Trapezium of Orion with a field illumination which was very unsteady, my left eye suddenly became bloodshot. After a rest of a week the eye resumed its natural appearance, but on observing again the blood reappeared in the eye. I then began to use my right eye, and have used it since in most of the observations. From a number of trials I think that this change of eyes has produced only a small change in my habit of observing an angle of position. Still it is possible that some systematic difference in the angles may exist on account of this change, as there was at first some awkwardness in observing with my right eye. In all my observations the head of the observer was kept in an upright or natural position.

MAY 17, 1880.

OBSERVATIONS OF DOUBLE STARS

SELECTED BY

DIRECTOR OTTO STRUVE,

FOR THE

COMPARISON OF MICROMETRICAL MEASUREMENTS.

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§ 5.

These stars have been observed with the filar micrometer made by A. **Clark** and **Sons** that is commonly used with the 26-inch Refractor. The manner of observing was the same as usual, except that when the distances exceed 20″ the angle of position was observed by bisecting the stars with the wire, and in case of distances that exceed 3″ each observation depends on four measures of the double distance instead of two. The angle of position is designated by p and the distance by s.

The value of a revolution of the micrometer screw used in reducing these measures is

$$R = 9''.9479,$$

and no correction for change of temperature has been applied to this value. The mean value of the correction for differential refraction is denoted by Δp.

The positions of the stars are for the epoch 1875.0, and are taken from **Struve**.

Σ. 170.

$\alpha = 1^h\,43^m.9.$ $\delta = 75^\circ\,36'$ (6.7 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.772	22.1	247.6	3.23	3	606	
8.783	21.1	246.7	3.43	2	383	
8.788	21.4	247.1	3.08	2	606	
8.791	21.8	246.9	3.07	2	606	Images blurred; clouds.
8.794	21.8	247.7	3.13	2	383	Thin clouds.
8.805	21.8	245.9	3.17	2	606	
9.098	3.4	246.7	3.09	3	383	
9.106	4.1	247.1	3.25	3	383	
9.109	4.1	245.7	3.15	2	383	
9.144	4.7	245.6	3.19	3	383	
9.831	23.5	246.6	3.32	2	606	
9.834	22.1	247.4	3.33	3	606	

Σ. 191.

$\alpha = 1^h\ 52^m.1$ $\delta = 73^\circ\ 15'$ (6 and 8.9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1878.772	22.5	188.9	5.57	3	606	
8.783	21.4	188.2	5.57	2	383	
8.788	21.8	188.8	5.55	2	606	
8.791	22.1	186.9	5.62	2	606	
8.794	22.2	186.0	5.49	2	383	Clouds.
8.805	22.1	189.4	5.63	3	606	
9.098	3.7	193.5	5.60	2	383	Clouds.
9.106	4.5	194.0	5.50	2	383	
9.109	4.4	194.9	5.57	2	383	
9.144	5.1	194.4	5.57	2	383	
9.730	22.6	188.8	5.75	2	606	
9.738	20.7	188.0	5.67	2	606	
9.741	20.9	189.5	5.70	2	606	
9.820	22 8	189.9	5.66	2	383	
9.828	23.2	191.6	5.68	2	383	
9.831	23.8	193.7	5.82	2	383	
9.834	22.4	189.7	5.71	2	606	

56 Aurigæ = σ 224.

$\alpha = 6^h\ 37^m.7$ $\delta = 43^\circ\ 42'$ (5.6 and 8.9).

1877.258	8.2	21.04	48.39	2	606	The sky hazy.
7.263	8.5	21.24	48.28	4	383	
7.266	8.6	21.11	48.26	3	383	
7.269.	9.7	21.04	48.51	2	383	
7.280	8.4	21.19	48.49	3	606	
7.282	9.8	21.29	. .	1	606	A gale coming up.
7.288	8.7	21.49	48.26	2	606	
7.296	9.8	21.21	48.24	3	383	
7.310	9.1	21.00	48.29	4	606	
7.313	9.1	20.95	48.29	3	606	
	$\Delta\rho =$	+ 0.006	+ 0.014			

Σ. 1169.

$\alpha = 7^h\ 57^m.2$ $\delta = 79^\circ\ 52'$ (7.8 and 8).

1877.269	9.4	11.18	20.97	2	383	
7.280	8.8	11.34	20.99	2	606	
7.282	9.5	11.58	20.89	2	606	
7.288	9.2	11.02	20.86	2	606	
7.313	9.6	10.98	20.82	3	383	
7.315	10.0	11.40	21.00	2	383	
	$\Delta\rho =$	+ 0.074	+ 0.008			

Σ. 1321.

$\alpha = 9^h\ 6^m.0$ $\delta = 53°\ 14'$ (7.8 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1877.263	9.0	58.93	19.54	3	383	
7.266	9.0	59.01	19.65	4	383	
7.269	8.8	59.41	19.54	3	383	
7.280	9.2	58.90	19.73	3	383	
7.288	9.5	59.12	19.73	2	383	
7.313	9.9	59.05	19.63	3	383	
9.314	11.2	239.38	19.70	2	383	
9.319	10.2	59.70	19.63	3	383	
9.451	13.5	239.00	19.51	2	383	
	$\Delta\rho =$	+ 0.005	+ 0.006			

Σ. 1350.

$\alpha = 9^h\ 23^m.9$ $\delta = 67°\ 21'$ (7 and 7.8).

1877.288	9.9	67.05	10.53	3	383	
7.318	10.6	66.7	10.65	2	383	
7.337	10.3	66.3	10.55	2	383	
7.370	12.5	65.5	10.64	2	383	
7.375	13.9	66.3	10.66	2	383	Images diffuse.
1877.378	14.2	66.4	10.66	3	383	Thin clouds.
1880.044	5.2	247.7	10.52	3	383	
0.058	3.3	66.3	10.57	2	383	
0.064	4.5	68.0	10.67	2	383	
0.066	4.6	67.5	10.63	2	606	

7 Leonis.

$\alpha = 9^h\ 29^m.1$ $\delta = 14°\ 56'$ (5.6 and 8).

1877.263	9.4	79.43	41.27	2	383	
7.269	8.4	79.53	41.16	2	383	
7.280	10.6	79.84	41.24	3	383	
7.288	10.4	79.90	41.24	2	606	
7.296	10.2	79.75	41.31	3	383	
7.312	10.3	79.85	41.37	3	383	
7.315	10.6	79.86	41.57	2	383	Through clouds.
7.318	9.5	79.74	41.29	2	383	
	$\Delta\rho =$	+ 0.002	+ 0.012			

Σ. 1495.

$\alpha = 10^h\ 52^m.1 \quad \delta = 59^\circ\ 35'$ (6 and 8.9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1877.318	10.9	38.00	34.56	2	383	Images blurred.
7.337	11.4	38.30	34.67	2	383	
7.370	12.8	37.62	34.70	2	383	
7.376	14.3	37.48	34.89	2	383	
7.378	14.5	37.62	34.78	3	383	
7.381	13.6	37.70	34.78	2	383	
	$\Delta\rho =$	+ 0.012	+ 0.010			

Σ. 1603.

$\alpha \quad 12^h\ 1\ .9 \quad \delta = 56^\circ\ 10'$ (7 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.370	13.3	81.62	22.48	2	383	
7.376	14.6	80.76	22.49	2	383	
7.378	14.9	81.45	22.44	3	383	
7.381	13.9	81.82	22.32	2	383	
7.384	13.2	81.42	22.59	2	383	Through clouds.
7.395	14.6	81.38	22.33	2	383	Telescope shaken by wind.
	$\Delta\rho =$	+ 0.009	+ 0.007			

Σ. 1685.

$\alpha = 12^h\ 45^m.7 \quad \delta = 19^\circ\ 51'$ (7 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.337	12.2	201.55	16.02	2	383	
7.370	11.9	201.0	16.03	2	383	
7.376	15.5	200.8	16.06	2	383	
7.378	15.7	200.65	16.25	3	383	
7.381	14.8	201.3	16.16	2	383	
7.384	14.1	200.2	16.25	3	383	
	$\Delta\rho =$	0.000	+ 0.007			

ι. Bootis.

$\alpha = 14^h\ 11^m.7 \quad \delta = 51^\circ\ 57'$ (5 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.376	15.0	32.72	38.30	3	383	
7.378	15.3	32.88	38.48	3	383	
7.381	14.4	32.86	38.31	2	383	
7.384	13.6	32.78	38.39	3	383	
7.397	14.6	33.08	38.37	2	383	
7.408	11.9	33.18	38.45	2	383	
	$\Delta\rho =$	+ 0.002	+ 0.011			

Σ. 2034.

$\alpha = 16^h\ 4^m.2 \quad \delta = 83°\ 59'$ (7.8 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1876.795	20.1	118.6	1.25	2	606	
6.798	19.9	120.3	1.30	2	606	Images much blurred.
6.801	19.8	118.3	1.34	3	383	
6.803	19.8	118.6	1.13	3	383	
7.422	15.4	111.5	1.28	2	606	Very faint; haze.
7.452	14.4	115.0	1.04	3	606	
7.460	14.4	114.8	1.19	2	383	
7.518	15.2	112.7	1.44	2	383	Images blurred.
7.532	15.4	113.8	1.29	2	383	
8.849	21.6	116.4	1.27	3	383	
8.854	21.7	114.8	1.34	2	383	Images blurred.
8.857	21.8	114.1	1.17	3	383	
8.860	21.1	115.9	1.23	3	383	
9.470	15.0	113.5	1.40	3	606	
9.543	16.6	114.3	1.34	2	606	
9.546	16.5	114.4	1.29	3	606	
9.549	16.6	114.2	1.29	3	606	

$\nu^1\ \nu^2$ Draconis.

$\alpha = 17^h\ 29^m.8 \quad \delta = 55°\ 15'$ (4.5 and 4.5).

1876.795	19.6	312.47	61.96	3	383	
6.798	19.5	312.50	61.84	3	383	
6.801	19.4	312.50	61.85	3	383	
6.803	19.5	312.50	61.84	3	383	
7.417	15.8	312.35	62.07	2	383	Clouds.
7.422	15.0	312.28	61.98	4	383	
7.428	16.0	312.37	61.87	2	383	
7.447	15.7	312.45	61.98	3	383	
	$\Delta\rho =$	+ 0°.005	+ 0″.020			

Σ. 2326.

$\alpha = 18^h\ 17^m.5 \quad \delta = 81°\ 27'$ (7.8 and 8.9).

1876.795	20.5	199.2	15.93	3	383	
6.798	20.3	199.3	15.97	3	383	
6.801	20.1	200.0	15.95	3	383	
6.803	20.1	200.1	. .	2	383	Thin clouds.
6.809	20.0	199.7	15.80	3	383	
7.422	15.8	198.6	15.94	3	606	
7.428	16.4	199.3	16.02	3	383	
7.452	14.8	198.4	15.91	2	606	
7.460	14.8	198.5	15.84	3	383	
	$\Delta\rho =$	− 0.005	+ 0.007			

O. Σ. **353.**

$\alpha = 18^h\ 22^m.6 \quad \delta = 71^\circ\ 16'$ (5 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.809	20.3	54.4	0.41	3	888	
6.825	19.9	53.8	0.44	3	888	
6.836	20.1	53.1	0.43	2	888	
9.470	17.0	51.0	0.53	2	888	Images blurred.
9.697	18.1	56.4	0.32	3	888	
9.699	18.2	50.4	0.34	2	888	
9.708	18.0	48.9	0.36	2	888	
9.713	18.0	49.6	0.33	3	888	

O. Σ. **363.**

$\alpha = 18^h\ 43^m.5 \quad \delta = 77^\circ\ 34'$ (7 and 7).

1876.809	20.6	23.1	0.39	3	888	
6.817	20.2	21.0	0.36	2	888	
6.825	20.2	19.1	0.43	3	888	
6.836	20.3	21.1	0.43	2	888	
9.470	17.3	206.5	0.32	2	888	
9.697	18.3	19.6	0.37	3	888	
9.699	18.4	201.3	0.45	2	888	
9.708	18.2	205.5	0.45	2	888	
9.713	18.3	206.6	0.41	2	888	

β **Lyræ.**

$\alpha = 18^h\ 45^m.5 \quad \delta = 33^\circ\ 13'$ (3 and 6.7)

1876.655	18.3	148.97	45.87	2	383	Face north.
6.658	18.2	149.09	45.87	2	383	Face north.
6.661	17.6	149.29	45.80	2	383	Face south.
6.664	18.2	149.15	45.75	3	383	Face south.
6.669	17.9	149.31	45.86	3	606	Face north.
6.675	18.2	149.16	45.91	2	606	Face north.
6.680	18.1	149.32	45.80	2	606	Face south.
6.710	18.2	149.16	45.82	2	606	Face south ; faint through clouds.
9.543	18.0	149.10	45.80	2	606	Face south.
9.546	18.0	148.91	45.83	2	383	Face east.
9.584	18.6	149.08	45.80	2	606	Face south.
9.587	18.5	149.12	45.98	3	383	Face north.
	$\Delta\rho =$	− 0.011	+ 0.012			

Σ. 2452.

$\alpha = 18^h\ 57^m.8$ $\delta = 75°\ 37'$ (6.7 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1876.781	19.3	218.5	5.55	2	383	
6.784	19.3	216.9	5.76	2	383	
6.787	19.3	217.8	5.71	3	383	
6.798	20.6	219.7	5.82	2	383	
6.801	20.6	221.3	5.64	3	383	
7.452	15.4	218.2	5.84	2	383	Haze; stars faint.
7.460	15.2	219.1	5.69	2	383	
7.518	15.6	218.7	5.72	2	383	
9.749	19.0	217.9	5.64	3	606	
9.752	19.0	218.1	5.65	2	383	

Σ. 2571.

$\alpha = 19^h\ 35^m.3$ $\delta = 78°\ 0'$ (7.8 and 8).

1876.749	19.3	22.7	11.49	4	383	
6.760	19.4	21.7	11.35	2	383	Images unsteady.
6.781	19.6	21.9	11.36	3	383	
6.784	19.6	21.8	11.44	2	383	
7.460	15.6	21.0	11.36	3	383	
7.518	16.0	20.9	11.41	2	383	
7.532	15.8	20.9	11.46	2	383	
7.534	15.8	20.7	11.33	2	383	
9.697	18.7	21.9	11.38	2	606	
9.699	18.6	22.5	11.40	3	606	
9.708	18.5	22.0	11.39	2	606	

ε Draconis.

$\alpha = 19^h\ 48^m.6$ $\delta = 69°\ 57'$ (4 and 7.8).

1876.746	19.3	4.3	3.01	3	383	
6.749	19.7	2.4	2.97	3	383	
6.760	19.6	1.1	3.00	2	383	
6.779	19.8	359.7	3.15	2	383	Images blurred.
6.781	19.8	0.0	3.04	3	383	
7.460	16.0	2.6	3.00	2	383	Blazing images.
7.518	16.3	1.6	2.74	2	383	
7.532	16.1	357.2	2.97	2	383	Images blurred.
7.534	15.5	4.0	2.89	2	383	
9.697	19.0	2.7	3.03	3	606	
9.699	18.8	4.3	3.09	3	606	
9.708	18.8	1.8	3.02	2	606	
9.713	18.6	3.9	3.03	2	383	

κ Cephei.

$\alpha = 20^h\ 13^m.1$ $\delta = 77°\ 20'$ (4 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1876.746	19.7	120.5	7.54	3	383	
6.749	20.0	121.8	7.49	3	383	
6.760	20.0	121.5	7.54	2	383	
6.779	20.2	121.1	7.53	2	383	
7.460	16.4	126.0	7.40	2	383	
7.518	16.7	123.4	7.48	2	383	
7.532	16.4	122.5	7.43	2	383	
7.534	16.1	125.0	7.40	2	383	
9.749	19.5	122.2	7.42	3	606	
9.752	19.3	120.7	7.43	3	383	

7 C.

$\alpha = 21^h\ 18^m.0$ $\delta = 78°\ 4'$ (7.8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.746	20.1	43.57	25.13	3	383	
6.749	20.3	43.52	25.13	3	383	
6.760	20.4	43.52	25.21	2	383	
6.779	20.5	43.15	25.04	2	383	Images very unsteady.
7.537	16.1	42.95	25.22	2	383	Very unsteady.
8.961	2.2	43.55	25.36	2	383	
8.969	1.2	43.38	25.09	3	383	
8.972	0.1	43.20	24.99	4	383	
	$\Delta\rho =$	+ 0.005	+ 0.008			

Σ. 2801.

$\alpha = 21^h\ 22^m.2$ $\delta = 79°\ 49'$ (7.8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.749	20.6	269.9	1.61	3	383	
6.760	20.6	272.4	1.73	2	383	
6.781	20.4	272.9	1.73	3	383	
6.784	20.1	273.1	1.76	2	383	
8.807	21.1	271.0	1.62	2	606	
8.818	20.6	272.1	1.52	3	606	
9.697	20.1	273.6	1.69	2	606	
9.699	20.3	276.1	1.76	2	606	Clouds.
9.719	20.5	274.4	1.55	3	606	
9.853	23.1	271.6	1.46	3	606	
9.861	22.8	270.3	1.72	3	606	
9.864	22.5	272.2	1.77	2	606	

β Cephei.

$\alpha = 21^h\ 27^m.0 \quad \delta = 70^\circ\ 1'$ (3 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.760	21.0	250.7	13.64	3	383	
6.781	20.7	250.0	13.47	3	383	
6.784	20.4	251.1	13.49	3	383	
6.787	20.6	250.1	13.66	3	383	
8.961	2.7	250.4	13.53	3	383	
8.969	1.5	252.3	13.62	2	383	
8.972	0.4	251.1	13.50	3	383	
9.040	2.3	250.3	13.24	2	383	
9.051	1.5	250.4	13.58	3	383	
9.057	2.1	250.1	13.49	2	383	

Σ. 2893.

$\alpha = 22^h\ 10^m.6 \quad \delta = 72^\circ\ 41'$ (5.6 and 7.8).

1876.781	21.1	347.92	28.88	3	383	
6.798	21.0	347.85	28.95	2	383	
6.801	20.8	348.03	28.92	3	383	
6.809	21.1	348.08	28.83	4	383	
8.961	1.8	348.60	28.95	2	383	
8.969	1.9	348.20	29.01	2	383	
8.972	1.4	348.35	29.09	2	383	Through clouds.
	Δρ	+ 0.008	+ 0.009			

Σ. 2924.

$\alpha = 22^h\ 29^m.4 \quad \delta = 69^\circ\ 17'$ (7 and 7.8).

1876.825	21.2	267.7	0.85	3	888	
6.836	20.7	262.5	0.80	2	606	
8.772	20.4	265.9	0.78	3	606	
8.783	19.6	264.4	0.82	2	606	Images blurred.
8.788	19.9	263.5	0.76	3	606	
8.791	20.0	264.3	0.71	3	606	
9.699	21.4	266.6	1.07	2	606	Images indistinct.
9.719	20.8	265.5	0.90	2	888	
9.730	21.4	268.4	0.87	3	606	
9.738	18.9	265.5	0.83	3	606	
9.738	20.9	267.3	0.87	3	606	
9.741	19.5	264.0	0.78	2	606	
9.741	21.1	267.5	0.86	3	606	

Σ. 2923.

$a = 22^h\ 29^m.7 \quad \delta = 69°\ 44'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.825	21.4	47.3	9.64	2	383	
6.836	20.9	46.5	9.47	3	383	
6.772	20.6	46.3	9.43	3	606	
8.783	19.9	46.2	9.43	2	606	
8.788	20.2	45.8	9.59	3	606	
8.791	20.3	46.1	9.59	3	606	
9.719	21.0	46.9	9.70	3	606	
9.730	21.6	47.3	9.47	3	606	
9.738	19.2	46.1	9.61	3	606	
9.741	19.8	46.4	9.56	2	606	

O. Σ. 481.

$a = 22^h\ 41^m.8 \quad \delta = 77°\ 52'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.825	21.7	268.0	2.49	2	383	
6.836	21.3	269.6	2.31	3	383	
8.772	20.9	270.5	2.39	3	606	
8.783	20.3	267.9	2.23	2	383	Images blurred.
8.788	20.5	268.2	2.37	3	606	
8.791	20.8	271.5	2.39	2	606	Hazy.
8.961	3.0	269.9	2.32	3	383	
8.969	2.2	271.7	2.52	2	383	
9.051	1.8	270.6	2.32	3	383	
9.057	2.3	270.0	2.32	2	383	

O. Σ. 489.

$a = 23^h\ 3^m.9 \quad \delta = 74°\ 43'$ (5 and 7.8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1878.772	21.3	24.8	1.15	2	888	
8.788	20.7	27.5	1.16	2	888	Images blurred.
8.805	21.0	26.1	1.20	3	606	
8.807	20.2	30.1	1.21	3	606	
8.818	20.2	28.0	1.06	3	606	
8.821	20.1	31.7	1.32	2	606	
9.730	21.8	24.1	1.21	3	606	
9.738	19.5	30.8	1.30	2	606	
9.741	20.1	29.6	1.36	2	606	
1879.749	19.8	28.0	1.17	2	606	
1880.044	2.1	25.2	1.03	2	606	
.058	2.0	25.8	1.16	2	606	
.064	2.2	27.4	1.25	2	606	Images blurred.
.066	2.5	26.5	1.24	2	606	Images blurred.

Σ. 3051.

$\alpha = 23^h\ 56^m.3 \quad \delta = 79°\ 35'$ (7.8 and 9.10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	″				
1878.772	21.8	23.4	16.99	3	606	
8.783	20.7	22.4	16.79	2	383	
8.788	21.0	22.1	16.95	2	606	Images blurred.
8.791	21.5	22.8	16.97	2	606	Hazy.
8.794	21.6	23.7	16.92	2	303	
8.805	21.4	22.8	16.92	3	606	
9.730	22.2	23.4	16.97	3	606	
9.738	20.3	22.6	16.90	2	606	
9.741	20.5	22.6	16.83	3	606	
	$\Delta\rho =$	− 0.017	+ 0.008			

The preceding observations were made in an average condition of the images, as will be seen from the numbers given in the column Wt. But probably in my earlier observations these numbers were estimated too low, and where 2 and 3 are given we should have 3 and 4. In deducing the final results I have taken the simple means without regard to the weights, or to the remarks, since it seems best that the varying conditions of the images from night to night should be allowed to exert their proper influence. It is sometimes surprising to see how observations made when the images are very unsteady agree with the mean result Probably this is caused by the fact that the observer in this case gives more time to the observation, and in this way gets nearly the mean position of the vibrating images. A few cases occur where there seems to be a mistake in the reading, but all the observations are given as they were made, and no observation has been rejected.

It will be noticed that in the observations of some of the stars, Σ. 191 and Σ. 2034, there seems to be a systematic error in the observed angles of position; but in computing the probable errors no regard has been paid to this fact, and the given probable errors of the angles are therefore a little too great.

In the case of *β* Lyræ, which passes near our zenith, I have changed my position from face north to face south, in order to see if any difference was produced in the measures by such a change, but there appears to be none.

The star Σ. 2034 has been one of the most troublesome to observe, because the images were frequently confused and indistinct The condition of things has often been as follows: I would be observing stars near the zenith, the images being tolerably good; on turning the telescope down toward the north to the star Σ. 2034, the images at first would be fair, but after a few minutes, and before an observation could be made, the images would become so bad that an observation was impossible, the stars being simply a confused mass of light. This condition was probably produced by the cool north wind blowing against the warm object-glass and disturbing its figure. Our large objective is very sensitive to changes of temperature, and will not perform well so long as these changes are rapid. The star O. Σ. 489 is another difficult object to observe.

In the following table are given the results of the preceding observations: the mean date of the observations, the mean values of the angles of position and the distances, and their probable errors. In the last columns are given the probable errors of a single observed angle and distance, and the number of observations.

The corrections for differential refraction, denoted by Δp, have been applied to the mean results.

Results.

Star.	Date.	p.	r_m	s.	r_m	r_1p.	r_1s.	No. of obs.
		°	′ ±	″	″ ±	″ ±	″ ±	
Σ. 170 . . .	1879.071	246.75	0.0078	3.203	0.0219	0.027	0.076	12
Σ. 191 . . .	1879.277	190.36	0.0446	5.627	0.0145	0.184	0.060	17
σ. 244 . . .	1877.282	21.162	0.0292	48.348	0.0232	0.092	0.070	10
Σ. 1169 . . .	1877.291	11.324	0.0234	20.930	0.0207	0.057	0.051	6
Σ. 1321 . . .	1877.974	59.172	0.0208	19.635	0.0188	0.062	0.056	9
Σ. 1350 . . .	1878.130	66.775	0.0306	10.608	0.0125	0.097	0.040	10
σ. 350 . . .	1877.293	79.740	0.0292	41.318	0.0293	0.083	0.083	8
Σ. 1495 . . .	1877.360	37.799	0.0510	34.740	0.0312	0.125	0.076	6
Σ. 1603 . . .	1877.381	81.421	0.0377	22.449	0.0284	0.092	0.069	6
Σ. 1685 . . .	1877.371	200.917	0.0372	16.135	0.0293	0.091	0.072	6
σ. 455 . . .	1877.387	32.909	0.0338	38.394	0.0200	0.083	0.049	6
Σ. 2034 . . .	1878.124	115.36	0.0086	1.270	0.0160	0.035	0.066	17
σ. 549 . . .	1877.114	312.433	0.0216	61.944	0.0204	0.061	0.058	8
Σ. 2326 . . .	1877.085	199.228	0.0396	15.927	0.0169	0.119	0.048	9
O. Σ. 353 . .	1878.595	52.20	0.0043	0.395	0.0171	0.012	0.048	8
O. Σ. 363 . .	1878.397	22.64	0.0046	0.401	0.0100	0.014	0.030	9
σ. 593 . . .	1877.636	149.128	0.0198	45.853	0.0120	0.069	0.042	12
Σ. 2452 . . .	1877.588	218.62	0.0257	5.702	0.0189	0.081	0.060	10
Σ. 2571 . . .	1877.838	21.64	0.0273	11.397	0.0100	0.090	0.033	11
Σ. 2603 . . .	1877.898	1.97	0.0205	2.995	0.0183	0.074	0.066	13
Σ. 2675 . . .	1877.658	122.47	0.0508	7.466	0.0122	0.161	0.038	10
Σ. 2796 . . .	1877.684	43.360	0.0240	25.154	0.0277	0.068	0.078	8
Σ. 2801 . . .	1878.616	272.47	0.0098	1.659	0.0203	0.034	0.070	12
Σ. 2806 . . .	1878.116	250.65	0.0352	13.522	0.0257	0.111	0.081	10
Σ. 2893 . . .	1877.727	348.155	0.0336	28.956	0.0217	0.089	0.057	7
Σ. 2924 . . .	1878.992	265.62	0.0050	0.838	0.0163	0.018	0.059	13
Σ. 2923 . . .	1878.772	46.49	0.0183	9.549	0.0200	0.058	0.063	10
O. Σ. 481 . .	1878.483	269.79	0.0122	2.366	0.0186	0.038	0.059	10
O. Σ. 489 . .	1879.429	27.54	0.0088	1.201	0.0165	0.033	0.062	14
Σ. 3051 . . .	1879.105	22.850	0.0350	16.924	0.0151	0.105	0.046	9

The whole number of my observations of these stars is 296. The mean distance of the thirty stars is 17″.16; and the average values of the probable errors of a single distance and of a single angle are as follows:

Probable error of a single distance = ± 0″.059
Probable error of a single angle = ± 0″.075

The further discussion of these observations must be deferred until the observations of other observers are published. It is my intention to continue the observations of a few of these stars, especially those of which the components are of very unequal magnitudes, and where the observations are difficult and appear to be subject to large systematic errors, such as Σ. 191, ε Draconis, and $O. \Sigma$. 489.

§ 6.

As it is interesting to apply a geometrical test to observations, in addition to the preceding work, I have observed the multiple stars Σ. 2703, Σ. 311, and the stars in the Trapezium of Orion. In the case of three stars, *A*, *B*, *C*, if we take the origin of co-ordinates at *A* and observe the angles of position and the distances of *B* and *C* only, then these quantities are independent, and we may put their differentials equal to zero. But if we observe also the angle of position and the distance between *B* and *C*, we have obtained more quantities than the geometrical conditions require, and must adjust the parts of the triangle by the method of least squares. The following is the method of W. Struve, *Mensuræ Micrometricæ*, p. L. From the observations we make

$$\alpha = s \cos p \qquad \beta = s \sin p$$
$$\alpha' = s' \cos p' \qquad \beta' = s' \sin p'$$

and the true values of these co-ordinates will be,

$$x = \alpha + \xi \qquad y = \beta + \eta$$
$$x' = \alpha' + \xi' \qquad y' = \beta' + \eta'$$

ξ, ξ', η, and η' being corrections to be found from the equations of condition. The geometrical relations give us the six equations:

$$x^2 + y^2 = s^2 \quad (1) \qquad \frac{y}{x} = \text{tang } p \quad (4)$$
$$x'^2 + y'^2 = s'^2 \quad (2) \qquad \frac{y'}{x'} = \text{tang } p' \quad (5)$$
$$(x'-x)^2 + (y'-y)^2 = s''^2 \quad (3) \qquad \frac{y'-y}{x'-x} = \text{tang } p''. \quad (6)$$

If we make

$$\text{tang } q'' = \frac{\beta' - \beta}{\alpha' - \alpha} \qquad \varepsilon'' = \frac{\beta' - \beta}{\sin q''} = \frac{\alpha' - \alpha}{\cos q''},$$

and put

$$ds'' = s'' - \varepsilon'' \qquad \pi'' = q'' - p'',$$

the differentiation of the six equations will give the following equations of condition for the triangle:

$$
\begin{array}{llllll}
\cos p.\ \xi & +\sin p.\ \eta & & & & =o. \\
\cos p.'\ \xi' & +\sin p.'\ \eta' & & & & =o. \\
\cos p.''\ \xi & -\cos p.''\ \xi' & +\sin p.''\ \eta & -\sin p.''\ \eta' & +s''-\varepsilon'' & =o. \\
\sin p.\ \xi & -\cos p.\ \eta & & & & =o. \\
\sin p.'\ \xi' & -\cos p.'\ \eta' & & & & =o. \\
\sin p.''\ \xi & -\sin p.''\ \xi' & -\cos p.''\ \eta & +\cos p.''\ \eta' & +\varepsilon''\sin\pi'' & =o.
\end{array}
$$

In the case of a quadrilateral, we shall have, if we put

$$\alpha''=s''\cos p'' \qquad \beta''=s''\sin p''$$

and

$$x''=\alpha''+\xi'' \qquad y''=\beta''+\eta'';$$

$$\operatorname{tang} q'''=\frac{\beta'-\beta}{\alpha'-\alpha} \qquad \varepsilon'''=\frac{\beta'-\beta}{\sin q'''}=\frac{\alpha'-\alpha}{\cos q'''}$$

$$\operatorname{tang} q^{\text{iv}}=\frac{\beta''-\beta}{\alpha''-\alpha} \qquad \varepsilon^{\text{iv}}=\frac{\beta''-\beta}{\sin q^{\text{iv}}}=\frac{\alpha''-\alpha}{\cos q^{\text{iv}}}$$

$$\operatorname{tang} q^{\text{v}}=\frac{\beta''-\beta'}{\alpha''-\alpha'} \qquad \varepsilon^{\text{v}}=\frac{\beta''-\beta'}{\sin q^{\text{v}}}=\frac{\alpha''-\alpha'}{\cos q^{\text{v}}},$$

$$q'''-p'''=\pi''' \qquad q^{\text{iv}}-p^{\text{iv}}=\pi^{\text{iv}} \qquad q^{\text{v}}-p^{\text{v}}=\pi^{\text{v}},$$

and the equations of condition are:

$$
\begin{array}{llllll}
\cos p.\ \xi & +\sin p.\ \eta & & & & =o. \\
\cos p.'\ \xi' & +\sin p.'\ \eta' & & & & =o. \\
\cos p.''\ \xi'' & +\sin p.''\ \eta'' & & & & =o. \\
\cos p.'''\ \xi & -\cos p.'''\ \xi' & +\sin p.'''\ \eta & -\sin p.'''\ \eta' & +s'''-\varepsilon''' & =o. \\
\cos p.^{\text{iv}}\ \xi & -\cos p.^{\text{iv}}\ \xi'' & +\sin p.^{\text{iv}}\ \eta & -\sin p.^{\text{iv}}\ \eta'' & +s^{\text{iv}}-\varepsilon^{\text{iv}} & =o. \\
\cos p.^{\text{v}}\ \xi' & -\cos p.^{\text{v}}\ \xi'' & +\sin p.^{\text{v}}\ \eta' & -\sin p.^{\text{v}}\ \eta'' & +s^{\text{v}}-\varepsilon^{\text{v}} & =o. \\
\sin p.\ \xi & -\cos p.\ \eta & & & & =o. \\
\sin p.'\ \xi' & -\cos p.'\ \eta' & & & & =o. \\
\sin p.''\ \xi'' & -\cos p.''\ \eta'' & & & & =o. \\
\sin p.'''\ \xi & -\sin p.'''\ \xi' & -\cos p'''\ \eta & +\cos p.'''\ \eta' & +\varepsilon'''\sin\pi''' & =o. \\
\sin p.^{\text{iv}}\ \xi & -\sin p.^{\text{iv}}\ \xi'' & -\cos p.^{\text{iv}}\ \eta & +\cos p.^{\text{iv}}\ \eta'' & +\varepsilon^{\text{iv}}\sin\pi^{\text{iv}} & =o. \\
\sin p.^{\text{v}}\ \xi & -\sin p.^{\text{v}}\ \xi'' & -\cos p.^{\text{v}}\ \eta' & +\cos p.^{\text{v}}\ \eta'' & +\varepsilon^{\text{v}}\sin\pi^{\text{v}} & =o.
\end{array}
$$

Generally the probable errors of the distances and of the angles will be found by comparing the observations among themselves, and the values of these errors will give the weights of the equations of condition. The equations depending on the distances or on the angles, being multiplied by the ratio of the probable errors, the system of equations will be ready for solution, which may be made according to the common method of least squares. If, however, the probable errors of the distances and the angles are nearly equal, we may give the weight unity to all the equations, and then the solution becomes very simple, since the co-efficients consist of sines and cosines symmetrically placed. In this case the solution for the triangle has been given by W. STRUVE, *Mensuræ Micrometricæ*, p LII, and it is easy to extend the solution to the quadrilateral. Thus, in this case, if we make for the triangle,

$$\begin{aligned}\varkappa_2 &= \cos p.'' \, (s'' - \varepsilon'') + \sin p.'' \, \varepsilon'' \sin \pi'', \\ \lambda_2 &= \sin p.'' \, (s'' - \varepsilon'') - \cos p.'' \, \varepsilon'' \sin \pi'',\end{aligned}$$

the normal equations are

$$\begin{aligned} +2\xi + 0\eta - \xi' + 0\eta' + \varkappa_2 &= 0 \\ +2\eta + 0\xi' - \eta' + \lambda_2 &= 0 \\ +2\xi' + 0\eta' - \varkappa_2 &= 0 \\ +2\eta' - \lambda_2 &= 0 \end{aligned}$$

Hence we have the equations

$$\xi + \xi' = 0 \qquad \eta + \eta' = 0,$$

and the values of the unknown quantities are

$$\xi = -\frac{\varkappa_2}{3} \qquad \eta = -\frac{\lambda_2}{3},$$

$$\xi' = +\frac{\varkappa_2}{3} \qquad \eta' = +\frac{\lambda_2}{3}.$$

For the quadrilateral we make

$$\begin{aligned} \varkappa_3 &= \cos p.''' \, (s''' - \varepsilon''') + \sin p.''' \, \varepsilon''' \sin \pi''' & \lambda_3 &= \sin p.''' \, (s''' - \varepsilon''') - \cos p.''' \, \varepsilon''' \sin \pi \;, \\ \varkappa_4 &= \cos p.^{\text{iv}} \, (s^{\text{iv}} - \varepsilon^{\text{iv}}) + \sin p.^{\text{iv}} \, \varepsilon^{\text{iv}} \sin \pi^{\text{iv}} & \lambda_4 &= \sin p.^{\text{iv}} \, (s^{\text{iv}} - \varepsilon^{\text{iv}}) - \cos p.^{\text{iv}} \, \varepsilon^{\text{iv}} \sin \pi^{\text{iv}}, \\ \varkappa_5 &= \cos p.^{\text{v}} \, (s^{\text{v}} - \varepsilon^{\text{v}}) + \sin p.^{\text{v}} \, \varepsilon^{\text{v}} \sin \pi^{\text{v}} & \lambda_5 &= \sin p.^{\text{v}} \, (s^{\text{v}} - \varepsilon^{\text{v}}) - \cos p.^{\text{v}} \, \varepsilon^{\text{v}} \sin \pi^{\text{v}} \;, \end{aligned}$$

and the normal equations are

$$\begin{aligned} +3\xi + 0\eta - \xi' + 0\eta' - \xi'' + 0\eta'' + \varkappa_3 + \varkappa_4 &= 0 \\ +3\eta + 0\xi' - \eta' + 0\xi'' - \eta'' + \lambda_3 + \lambda_4 &= 0 \\ +3\xi' + 0\eta' - \xi'' + 0\eta'' - \varkappa_3 + \varkappa_5 &= 0 \\ +3\eta' + 0\xi'' - \eta'' - \lambda_3 + \lambda_5 &= 0 \\ +3\xi'' + 0\eta'' - \varkappa_4 - \varkappa_5 &= 0 \\ +3\eta'' - \lambda_4 - \lambda_5 &= 0 \end{aligned}$$

Hence we have

$$\begin{aligned} \xi + \xi' + \xi'' &= 0 \\ \eta + \eta' + \eta'' &= 0, \end{aligned}$$

and the values of the unknown quantities are

$$\xi = \frac{-\varkappa_3 - \varkappa_4}{4} \qquad \eta = \frac{-\lambda_3 - \lambda_4}{4}$$

$$\xi' = \frac{+\varkappa_3 - \varkappa_5}{4} \qquad \eta' = \frac{+\lambda_3 - \lambda_5}{4}$$

$$\xi'' = \frac{+\varkappa_4 + \varkappa_5}{4} \qquad \eta'' = \frac{+\lambda_4 + \lambda_5}{4}$$

The following are my observations and reductions of the multiple stars. The corrections for differential refraction are denoted by $\varDelta\rho$:

Σ. 2703. *A* and *B*.

$\alpha = 20^h\ 31^m\ 2$ $\delta = 14^\circ\ 19'$ (8 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.678	21.0	110.35	25.40	2	383	
9.680	20.6	110.10	25.46	2	606	
9.683	19.5	110.77	25.37	3	606	
9.688	19.9	110.15	25.27	2	383	
9.691	20.7	110.32	25.36	2	383	
9.694	20.0	110.48	25.29	3	606	
9.697	20.4	110.38	25.29	2	383	
1879.687		110.364	25.349			
	$\Delta\rho$	+ 0.002	+ 0.007			
		110.366	25.356			

A and *C*. (8 and 8).

1879.678	21.1	217.13	58.03	2	383	
9.680	20.9	216.90	57.97	2	606	
9.683	19.7	216.90	57.90	2	606	
9.688	20.3	217.12	58.10	2	383	
9.694	20.2	217.05	57.99	3	606	
9.697	20.6	217.02	58.02	2	383	
1879.687		217.020	58.002			
	$\Delta\rho =$	− 0.002	+ 0.018			
		217.018	58.020			

B and *C*. (8 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.678	21.3	237.73	69 71	2	383	
9.680	21.0	237.55	69 79	2	606	
9.683	20.0	237.70	69.71	2	606	
9.688	20 5	237.55	69.63	2	383	
9 694	20.4	237.42	69.58	3	606	
9.697	20.8	237.45	69.65	2	383	
1879.687		237.567	69.678			
	Δρ =	− 0.002	+ 0.021			
		237.565	69.699			

$$\alpha = -\ 8''.8242 \qquad \beta = +\ 23''.7706.$$
$$\alpha' = -\ 46''.3256 \qquad \beta' = -\ 34''.9317.$$

Computing the probable errors of a single observation from the agreement of these observations among themselves, we have,

for a single distance, $r = \pm\ 0''.047$;
for a single angle, $r = \pm\ 0''.079$;

this last error corresponding to the mean distance of 51″.03. The equations of condition are as follows:

ξ	η	ξ'	η'	n		Residuals.
						″
9.5416*n*	9.9720	. .	. .	. .	= 0	+ 0.025
. .	. .	9.9022*n*	9.7796*n*	. .	= 0	+ 0.002
9.7311*n*	9.9257*n*	9.7311	9.9257	8.5911	= 0	+ 0.010.
9.9720	9.5416	. .	. .	. .	= 0	− 0.010
. .	. .	9.7796*n*	9.9022	. .	= 0	− 0.044
9.9257*n*	9.7311	9.9257	9.7311*n*	9.2216*n*	= 0	− 0.040

Assuming the weight of an equation depending on the distance as unity we have to multiply the equations derived from the angles by the factor 0.595. The normal equations are,

$$\begin{array}{rrrrrl} +\ 0.9736\,\xi & +\ 0.0823\,\eta & -\ 0.5413\,\xi' & -\ 0.2931\,\eta' & +\ 0.02869 & = 0 \\ & +\ 1.7347 & -\ 0.2931 & -\ 0.8128 & -\ 0.06462 & = 0 \\ & & +\ 1.3070 & +\ 0.6035 & -\ 0.02869 & = 0 \\ & & & +\ 1.4008 & +\ 0.06462 & = 0 \end{array}$$

The solution of these equations gives,

$$\xi = -\ 0''.0249; \qquad \eta = +\ 0''.0178$$
$$\xi' = +\ 0''.0431; \qquad \eta' = -\ 0''.0596$$

From the elimination we have $[nn.4] = 0.00439$; and from the substitution in the equations of condition we have $[nn.4] = 0.00437$. The probable error of an equaveight unity is therefore $\pm$ 0''.032, and the adjustment is satisfactory. The f the adjusted angles and distances are as follows:

$$p = 110^\circ.405 \qquad s = 25''.381$$
$$p' = 217\ .091 \qquad s' = 58\ .021$$
$$p'' = 237\ .510 \qquad s'' = 69\ .687$$

Epoch, 1879.687.

Σ. 311. *A* and *B*.

$\alpha = 2^h\ 42^m.3 \qquad \delta = 17^\circ\ 0' \qquad$ (5 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	''			
1879.918	1.7	122.0	3.23	3	606	
9.921	1.7	122.0	3.36	3	383	
9.935	0.4	120.2	3.42	2	383	
9.938	1.8	124.0	3.18	2	383	Hazy; clouds.
9.948	1.7	123.1	2.94	3	383	
9.957	1.5	124.4	3.54	2	383	
9.965	0.6	121.6	3.37	3	606	
1879.940		122.47	3.291			

A and *C*. (5 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.918	1.9	109.58	25.10	2	606	
9.921	1.9	110.30	25.13	3	383	
9.935	0.6	109.68	25.30	3	383	
9.948	1.8	109.68	25.21	2	383	
9.957	1.7	110.02	25.14	2	383	
9.965	0.9	110.12	25.15	3	606	
		109.90	25.172			
	$\Delta p =$	0.00	+ 0.008			
1879.941		109.90	25.180			

B and *C*. (9 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.918	2.0	107.70	21.55	2	606	Image blurred.
9.921	2.0	107.68	21.81	3	383	
9.935	0.9	107.78	21.72	2	383	Hazy.
9.948	2.1	108.40	21.91	3	383	
9.957	1.9	107.68	21.60	2	383	
9.965	1.1	107.75	21.91	3	606	
		107.83	21.750			
	$\Delta p =$	0.00	+ 0.007			
1879.941		107.83	21.757			

$$\alpha = -1''.7668 \qquad \beta = +2''.7765$$
$$\alpha' = -8''.5708 \qquad \beta' = +23''.6767$$

The probable error of a single observation is

for a single distance - - $r = \pm 0''.072$
for a single angle - - - $r = \pm 0''.094$

at the mean distance 16''.74. Since the stars in this group are difficult to observe, and the probable errors of the distances and the angles are not very different, I have assumed that all the equations have the weight unity. The equations of condition are:

ξ	η	ξ'	η'	n		Residuals.
						''
9.7299n	9.9262	. .	. .	. .	= 0	+ 0.078
. .	. .	9.5320n	9.9733	. .	= 0	− 0.075
9.4860n	9.9786	9.4860	9.9786n	9.3483n	0	− 0.074
9.9262	9.7299	. .	. .	. .	= 0	− 0.006
. .	. .	9.9733	9.5320	. .	= 0	+ 0.023
9.9786	9.4860	9.9786n	9.4860n	8.8865	= 0	+ 0.026

In this case we have

$$\varkappa_2 = +0''.1416 \qquad \lambda_2 = -0''.1887$$

and the values of the unknown quantities are

$$\xi = -0''.0472 \qquad \eta = +0''.0629$$
$$\xi' = +0''.0472 \qquad \eta' = -0''.0629$$

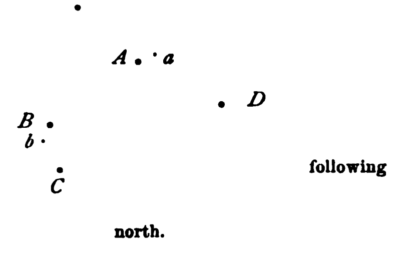
The sum of the squares of the residuals is 0''.01843, and the probable error of an equation of weight unity is ± 0''.065. This adjustment is also satisfactory.

The values of the adjusted angles and distances are

$$\begin{array}{ll} & {}^{\circ} \\ p & = 122.57 \\ p' & = 109.85 \\ p'' & = 107.90 \end{array} \qquad \begin{array}{ll} & {}'' \\ s & = 3.369 \\ s' & = 25.105 \\ s'' & = 21.831 \end{array}$$

Epoch, 1879.941.

The following are my observations of the multiple star θ' Orionis. I have designated the brightest star of the group by the letter A, and the other stars by letters, as shown in the diagram. The observations of 1877 were made with bright wires in a dark field, and those of 1878 with dark wires in a bright field In 1877 each distance depends on two measurements of the double distance, but in 1878 four measurements of the double distance were made. The field illumination was, however, very unsteady, and it was during these observations of 1878 that I was obliged to change eyes in observing. This fact, together with the unsteadiness of the illumination, will



account for the nearly equal probable errors of the different methods of observation, notwithstanding fewer measurements of the distances were made in 1877 than in 1878. Computing the values of the probable errors of a single observation, we have in 1877:

Probable error of a single distance - - $r = \pm 0''.061$
Probable error of a single angle - - - $r = \pm 0.057$

at the mean distance 15''.56.
And in 1878:

Probable error of a single distance - - $r = \pm 0''.051$
Probable error of a single angle - - - $r = \pm 0.069$

These values of the probable errors of the distances and the angles are so nearly equal that I have given the weight unity to all the equations of condition.

θ' **Orionis** = Σ. 748. *A* and *B*.

$\alpha = 5^h\ 29^m.2$ $\delta = -5^\circ\ 28'4$ (5 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	''			
1877.085	3.3	311.1	13.14	3	383	
7.090	3.7	310.6	12.98	2	383	
7.104	4.0	311.2	13.15	3	383	
7.109	4.0	310.4	13.21	2	383	
7.112	4.4	310.8	13.11	3	383	
7.115	4.6	311.1	13.28	3	383	
1877.103		310.87	13.145			
	$\Delta\rho$	+ 0.01	+ 0.008			
		310.88	13.153			
A and *C*. (5 and 8).						
1877.085	3.6	342.1	16.97	2	383	
7.090	4.1	342.5	16.78	2	383	
7.104	4.2	342.2	16.79	3	383	
7.109	4.3	342.5	16.92	2	383	
7.112	4.6	342.5	16.84	2	383	
7.115	4.8	343.0	16.72	3	383	
7.164	5.1	342.6	16.80	3	383	
7.205	7.0	342.4	16.86	2	383	
1877.123		342.48	16.835			
	$\Delta\rho =$	0.00	+ 0.010			
		342.48	16.845			

A and *D*. (5 and 6).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1877.085	3.8	60.4	13.53	2	383	
7.090	4.5	61.3	13.49	2	383	
7.104	4.5	61.4	13.42	3	383	
7.109	4.5	61.2	13.72	2	383	
7.112	4.9	60.8	13.53	3	383	
7.115	5.0	61.7	13.38	3	383	
1877.103		61.13	13.512			
	Δρ =	0.00	+ 0.004			
		61.13	13.516			
***A* and *a*. (5 and 10).**						
1877.085	4.2	119.2	4.15	2	383	
7.104	4.7	121.2	3.96	3	383	
7.112	3.8	122.0	4.04	3	383	
7.115	4.2	120.7	3.87	3	383	
1877.104		120.78	4.005			
***B* and *D*.**						
1877.129	5.0	95.5	21.62	3	383	
7.164	5.8	95.4	21.49	3	383	
7.172	6.1	95.7	21.76	2	383	
7.192	7.1	95.4	21.74	2	383	
7.205	6.1	95.5	21.67	2	383	
7.219	7.5	95.5	21.72	2	383	
1877.180		95.50	21.667			
	Δρ =	0.00	+ 0.006			
		95.50	21.673			
***B* and *b*. (7 and 10).**						
1877.085	4.4	351.7	4.10	2	383	
7.104	4.9	352.3	4.29	2	383	
7.112	4.2	351.2	4.21	3	383	
7.115	4.4	351.0	4.24	3	383	
1877.104		351.55	4.210			

C and *B*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1877.118	4.4	214.7	8.76	3	383	
7.126	4.0	213.1	8.70	2	383	
7.129	4.2	214.5	8.78	3	383	
7.164	5.3	212.5	8.77	2	383	
7.172	5.2	212.3	8.84	3	383	
7.192	6.5	213.3	8.77	2	383	
7.205	6.7	213.0	8.56	2	383	
7.219	7.0	213.1	8.66	2	383	
1877.166		213.31	8.730			
	Δρ =	− 0.01	+ 0.004			
		213.30	8.734			

C and *D*.

1877.118	5.1	118.8	19.40	3	383	
7.129	4.4	119.1	19.54	3	383	
7.164	5.6	119.3	19.54	3	383	
7.172	5.6	119.3	19.46	2	383	
7.192	6.8	119.1	19.46	2	383	
7.205	6.4	119.4	19.41	2	383	
7.219	7.3	119.3	19.41	2	383	
1877.171		119.19	19.460			
	Δρ =	+ 0.01	+ 0.006			
		119.20	19.466			

C and *a*.

1877.118	4.1	155.4	19.93	3	383	
7.129	3.9	155.0	19.95	3	383	
7.164	6.1	154.8	20.12	2	383	
7.192	6.2	154.9	19.93	3	383	
7.219	6.7	154.2	19.72	2	383	
1877.164		154.86	19.930			
	Δρ =	0.00	+ 0.007			
		154.86	19.937			

C and *b*.

1877.118	4.8	239.6	6.16	3	383	
7.126	4.3	240.5	6.28	2	383	
7.129	4.7	240.4	6.33	3	383	
7.164	6.3	240.1	6.17	2	383	
7.183	6.4	239.6	. .	4	383	Clouds.
7.192	5.9	240.8	6.25	3	383	
7.219	6.5	238.0	6.19	2	383	
1877.162		239.86	6.230			

A and *B*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1878.101	4.2	310.95	13.23	2	383	
8.103	4.6	310.03	13.31	2	383	
8.142	4.7	311.03	13.20	3	383	
8.161	5.1	311.27	13.06	3	383	
8.163	5.0	311.23	13.23	2	383	
8.166	5.1	310.47	13.19	3	383	
8.177	5.2	310.20	13.17	3	383	
1878.145		310.74	13.199			
	Δρ=	+ 0.01	+ 0.006			
		310.75	13.205			

A and *C*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1878.103	5.0	342.15	16.65	2	383	
8.142	5.0	342.73	16.83	3	383	
8.161	5.3	343.37	16.77	3	383	
8.163	5.2	342.70	16.87	3	383	
8.166	5.3	342.05	16.80	3	383	
8.177	5.5	342.33	16.73	3	383	
8.185	5.7	342.50	16.71	3	383	
1878.157		342.55	16.766			
	Δρ=	0.00	+ 0.009			
		342.55	16.775			

A and *D*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1878.103	5.4	61.87	13.34	2	383	
8.142	5.3	61.63	13.48	3	383	
8.161	5.5	61.33	13.38	3	383	
8.163	5.4	61.27	13.55	2	383	
8.166	5.6	61.13	13.41	3	383	
8.177	5.7	61.65	13.41	3	383	
8.185	6.1	61.65	13.29	3	383	
1878.157		61.50	13.409			
	Δρ=	− 0.01	+ 0.005			
		61.49	13.414			

B and *D*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1878.142	5.8	94.95	21.49	3	383	
8.161	5.9	95.65	21.67	3	383	
8.163	5.9	95.75	21.76	2	383	
8.166	6.1	95.47	21.78	2	383	

B and *D*—Continued.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1878.177	6.5	95.75	21.67	3	383	
8.185	6.4	95.70	21.57	3	383	
8.218	6.8	95.95	21.72	2	383	
1878.173		95.60	21.666			
	$\Delta\rho =$	0.00	+ 0.006			
		95.60	21.672			
***C* and *B*.**						
1878.142	5.5	213.30	8.76	3	383	
8.161	5.9	214.13	8.92	3	383	
8.163	5.6	213.23	8.75	2	383	
8.166	5.8	213.87	8.78	2	383	
8.177	6.0	213.27	8.75	3	383	
8.218	6.5	213.50	8.80	2	383	
1878.171		213.55	8.793			
	$\Delta\rho =$	− 0.01	+ 0.004			
		213.54	8.797			
***C* and *D*.**						
1878.142	6.1	119.03	19.37	3	383	
8.161	6.2	118.65	19.38	3	383	
8.163	6.1	119.67	19.36	2	383	
8.166	6.3	119.10	19.33	2	383	
8.177	6.8	119.60	19.40	3	383	
8.218	7.3	119.05	19.48	2	383	
1878.171		119.18	19.387			
	$\Delta\rho =$	0.00	+ 0.006			
		119.18	19.393			
***C* and *a*.**						
1878.177	7.0	154.27	19.96	3	383	
8.224	6.6	154.23	20.09	2	383	
8.226	6.7	154.43	20.01	3	383	
1878.209		154.31	20.020			
	$\Delta\rho =$	0.00	+ 0.007			
		154.31	20.027			

C and *b*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1878.226	8.0	238.53	6.38	2	383	
8.232	7.5	237.37	. .	2	383	
8.235	7.5	239.15	6.53	3	383	
1878.231		238.35	6.455			
			D and *a*.			
1878.226	6.9	225.63	12.06	2	383	
8.232	7.2	224.13	12.00	2	383	
1878.229		224.88	12.030			
			D and *b*.			
1878.226	7.3	285.43	23.15	2	383	
8.270	8.2	285.45	23.02	2	383	
1878.248		285.44	23.085			
	$\Delta p =$	− 0.01	+ 0.007			
		285.43	23.092			

For the four principal stars, *A*, *B*, *C*, *D*, we have from the observations of 1877

$$\alpha = +\ 8''.6084 \qquad \beta = -\ 9''.9450$$
$$\alpha' = +\ 16.0633 \qquad \beta' = -\ 5.0710$$
$$\alpha'' = +\ 6.5259 \qquad \beta'' = +\ 11.8362$$

The following are the equations of condition:

(1877).

ξ	η	ξ'	η'	ξ''	η''	n	Residuals.
							″
9.8159	9.8786*n*	. .	. .	. .	. .	. .	− 0.029
. .	. .	9.9794	9.4786*n*	. .	. .	. .	− 0.034
. .	. .	. .	. .	9.6838	9.9424	. .	− 0.021
9.9221	9.7396	9.9221*n*	9.7396*n*	. .	. .	9.2380*n*	− 0.039
8.9816*n*	9.9980	. .	. .	8.9816	9.9980*n*	9.3160*n*	− 0.108
. .	. .	9.6883*n*	9.9410	9.6883	9.9410*n*	8.7404	+ 0.072
9.8786*n*	9.8159*n*	. .	. .	. .	. .	. .	+ 0.075
. .	. .	9.4786*n*	9.9794*n*	. .	. .	. .	+ 0.054
. .	. .	. .	. .	9.9424	9.6838*n*	. .	+ 0.025
9.7396	9.9221*n*	9.7396*n*	9.9221	. .	. .	8.2815*n*	− 0.066
9.9980	8.9816	. .	. .	9.9980*n*	8.9816*n*	8.1730*n*	+ 0.021
. .	. .	9.9410	9.6883	9.9410*n*	9.6883*n*	8.8879	+ 0.019

Assigning to each equation the weight unity, the solution by least squares gives,

$$\begin{array}{llll} & '' & & '' \\ \xi & = +0.0375 & \eta & = +0.0716 \\ \xi' & = -0.0489 & \eta' & = -0.0412 \\ \xi'' & = +0.0114 & \eta'' & = -0.0304 \end{array}$$

The sum of the squares of the residuals is by elimination 0.03562, and by substitution 0.03513. The probable error of a single equation is, therefore, ±0''.052.

From the observations of 1878 we have for the same stars,

$$\begin{array}{llll} & '' & & '' \\ \alpha & = +\ 8.6196 & \beta & = -10.0037 \\ \alpha' & = +16.0030 & \beta' & = -\ 5.0304 \\ \alpha'' & = +\ 6.4027 & \beta'' & = +11.7875 \end{array}$$

(1878).

ξ	η	ξ'	η'	ξ''	η''	n	Residuals.
							''
9.8148	9.8794n	. .	. .	. .	. .	. .	− 0.072
. .	. .	9.9795	9.4769n	. .	. .	. .	− 0.030
. .	. .	. .	. .	9.6788	9.9439	. .	+ 0.005
9.9209	9.7424	9.9209n	9.7424n	. .	. .	9.0212n	+ 0.003
8.9894n	9.9979	. .	. .	8.9894	9.9979n	9.3655n	− 0.114
. .	. .	9.6880n	9.9411	9.6880	9.9411n	8.4393	+ 0.057
9.8794n	9.8148n	. .	. .	. .	. .	. .	− 0.045
. .	. .	9.4769n	9.9795n	. .	. .	. .	+ 0.069
. .	. .	. .	. .	9.9439	9.6788n	. .	+ 0.068
9.7424	9.9209n	9.7424n	9.9209	. .	. .	8.8187	− 0.031
9.9979	8.9894	. .	. .	9.9979n	8.9894n	8.9025	+ 0.016
. .	. .	9.9411	9.6880	9.9411n	9.6880n	9.2605	+ 0.072

Giving, as before, to each equation the weight unity, the solution by least squares gives the following values of the corrections:

$$\begin{array}{llll} \xi & = -0''.0128 & \eta & = +0''.0840 \\ \xi' & = -0\ .0492 & \eta' & = -0\ .0564 \\ \xi'' & = +0\ .0620 & \eta'' & = -0\ .0276 \end{array}$$

The sum of the squares of the residuals is by elimination 0''.03963, and by substitution 0''.04017. Hence the probable error of a single equation is ± 0''.055.

In both years the probable error of an equation of weight unity is nearly the same as that of a single observation; and this result shows that, as in the case of the triangles, the systematic errors committed in measuring the parts of the quadrilateral have not exerted too great an influence. Applying the corrections to the values of α,

$\alpha,'$ α'', β, β', β'', we have the following values of the angles and distances of the four principal stars of this group:

(1877).

$p\ = 311^\circ.208$,	$s\ = 13''.124$,	*A* and *B*.
$p'\ = 342\ .296$,	$s'\ = 16\ .810$,	*A* *C*.
$p''\ = 61\ .025$,	$s''\ = 13\ .495$,	*A* *D*.
$p'''= 32\ .869$,	$s'''= 8\ .773$,	*B* *C*.
$p^{\text{iv}} = 95\ .555$,	$s^{\text{iv}} = 21\ .781$,	*B* *D*.
$p^{\text{v}} = 119\ .256$,	$s^{\text{v}} = 19\ .392$,	*C* *D*.

Epoch, 1877.142.

(1878).

$p\ = 310^\circ.946$,	$s\ = 13''.133$,	*A* and *B*.
$p'\ = 342\ .315$,	$s'\ = 16\ .745$,	*A* *C*.
$p''\ = 61\ .201$,	$s''\ = 13\ .420$,	*A* *D*.
$p'''= 33\ .338$,	$s'''= 8\ .794$,	*B* *C*.
$p^{\text{iv}} = 95\ .643$,	$s^{\text{iv}} = 21\ .785$,	*B* *D*.
$p^{\text{v}} = 119\ .391$,	$s^{\text{v}} = 19\ .335$,	*C* *D*.

Epoch, 1878.162.

The relative proper motions of these four stars, which probably form a physical system, have been discussed by several astronomers, but these motions seem to be small and not yet determined with certainty. In what precedes I have omitted the two small stars *a* and *b*, since they are more difficult to observe.

It will be seen that in the case of the triangles and the quadrilateral the residuals indicate no important systematic errors. But probably some compensation of these errors will occur when all the parts of the figure are measured at nearly the same hour angle; and in future observations of this kind it would be interesting to measure some of the parts at quite different hour angles.

During my observations I never saw any star within the trapezium, and several careful examinations were made.

§ 7.

OBSERVATIONS OF DOUBLE STARS.

1875–1880.

The following observations of double stars with the 26-inch refractor were made at times when the instrument was not needed for its principal work on satellites and nebulæ. Most of these stars are those observed by the STRUVES, but a few other stars have been observed, chiefly those discovered by Mr. S. W. BURNHAM.

Nearly all these observations depend on four settings of the position circle, and on two measurements of the double distance As has been stated before, a few of my early observations of the distances depend on four measurements; but I soon found that two measurements give all the accuracy necessary on a single night; and probably a single careful measurement is sufficient, although it is better to make two as a check on the readings of the micrometer. The varying condition of the images of the stars from night to night is such that a better result is obtained by increasing the number of nights of observation, rather than by repeating the measurements of a single night. A few measurements of the quadruple distance were made among the early observations, but this method was not satisfactory, and the results, although printed, have been rejected in taking the means.

I have revised all the work, and hope that no important errors remain in the reductions. A few cases occur where it is probable that some error was made in reading the micrometer, and in such cases the result is printed but is not included in the mean value. All results that have been rejected in taking the means are inclosed in parentheses. No attempt has been made to discover new double stars, of which a great number of the fainter kind might be found with this instrument; but a few have been found by Mr. G. Anderson in the course of our work and are designated by the letters G. A. with a number attached.

The following table showing the probable errors of a single observation has been computed by Professor Frisby. In this computation the formula for the residuals themselves and not their squares has been used, and all the stars have been included. In some cases the observations were made with difficulty, as in the case of Marth's distant companion of Sirius and Burnham's distant companion of Aldebaran; so that the probable errors are greater than they would be for stars of the same distance and of sufficient brightness to observe with ease. The first column gives the order of the star according to W. Struve, except that the Order VIII includes all stars of a distance greater than 24″.

Probable Errors of a single observation.

Order.	Mean Distance.	$r_1 p$	$r_1 s$	Number of observations.
	″	″	″	
I	0.66	± 0.025	± 0.049	276
II	1.29	0.028	0.075	282
III	2.98	0.065	0.081	281
IV	5.58	0.100	0.066	192
V	9.91	0.145	0.108	53
VI	14.60	0.160	0.112	33
VII	20.74	0.163	0.108	33
VIII	53.03	0.352	0.270	34

The observations are printed in the following manner, which has been chosen in order to avoid as far as possible the introduction of notes and remarks. First the name of the star is given, and on the next line is its position for 1880 and the magnitudes; taken when possible from the Struves. The first column gives the date of the observation, the third decimal of the year being printed in order to indicate the day. The second column gives the sidereal time of the observation to the nearest tenth of an hour, and the next two columns the angle of position and the distance, *p* and *s*. The fifth and sixth columns give the weight of the observation and the magnifying power, and the last the remarks on the observations In deriving the mean results I have generally taken the simple mean without regard to the weights or the remarks; but when the remark is added "images blurred," or "images indistinct," I have given to the observation a weight of one-half. The mean value of the corrections for differential refraction has been applied to the result of the observations. This correction is denoted by Δp.

Σ. 3063.

$\alpha = 0^h\ 1^m.5$ $\delta = -5°\ 12'$ (9 and 10).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1878.046	2.3	222.2	1.91	2	606	
8.051	2.2	222.4	1.86	3	383	
1878.048		222.30	1.885			

Σ. 2.

$\alpha = 0^h\ 2^m.7$ $\delta = 79°\ 2'$ (6 and 7).

1879.083	Not separated.	3	868
9.845	Not separated.	3	868

O. Σ. 2. *A* and *B*.

$\alpha = 0^h\ 7^m.4$ $\delta = 26°\ 20'$ (7 and 8).

1879.787	0.1	39.4	0.70	3	888
9.817	23.4	44.8	0.81	2	606
9.845	22.4	41.5	0.63	2	888
1879.816		41.90	0.713		

O. Σ. 2. *A* and *C*. (7 and 10).

1879.787	0.0	224.5	17.55	3	606
9.817	23.5	224.4	17.59	2	606
1879.802		224.45	17.570		
	Δp	0.00	+ 0.005		
		224.45	17.575		

Σ. 13.

$\alpha = 0^h\ 9^m.1$ $\delta = 76^\circ\ 19'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.828	23.5	89.6	0.65	2	888	Very unsteady.
9.834	21.7	94.4	0.54	3	888	
9.844	22.1	95.7	0.63	3	888	
1879.835		93.23	0.607			

Σ. 19.

$\alpha = 0^h\ 10^m.6$ $\delta = 35^\circ\ 58'$ (7 and 10).

1875.976	1.3	126.5	2.43	3	383	
5.979	0.8	127.6	2.68	2	383	
1875.977		127.05	2.555			

Σ. 23.

$\alpha = 0^h\ 11^m.3$ $\delta = -0^\circ\ 21'$ (7 and 10).

1875.976	1.5	350.8	8.76	3	383	
5.979	0.5	352.6	8.63	2	383	
1875.977		351.70	8.695			

Σ. 24.

$\alpha = 0^h\ 12^m.3$ $\delta = 25^\circ\ 29'$ (7 and 8).

1878.051	2.6	249.2	5.23	2	383	
8.054	2.2	248.6	5.09	3	383	
1878.052		248.90	5.160			

λ Cassiopeæ.

$\alpha = 0^h\ 25^m.2$ $\delta = 53^\circ\ 52'$ (5 and 6).

1879.083	3.3	319.9	0.45	3	888	
9.097	3.1	319.9	0.39	2	888	
9.105	3.3	324.8	0.40	2	888	
9.108	3.7	315.8	0.39	2	888	
1879.098		320.10	0.408			

Σ. 44.

$\alpha = 0^h\ 32^m.0 \quad \delta = 40° \ 20'$ (8 and 9).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.061	3.8	264.9	9.18	3	383	
9.064	3.1	265.1	9.23	2	383	
1879.063		265.00	9.205			

Σ. 51.

$\alpha = 0^h\ 37^m.3 \quad \delta = 16° \ 42'$ (8 and 10).

1879.844	22.8	130.1	4.11	2	606	
9.864	22.9	129.6	4.38	2	383	
9.866	22.9	129.8	4.20	3	383	Clouds.
1879.858		129.83	4.230			

78 Cassiopeæ = Σ. 59.

$\alpha = 0^h\ 41^m.2 \quad \delta = 50° \ 47'$ (7 and 8).

1879.853	23.7	144.9	2.18	2	606	
9.861	23.1	145.0	2.16	3	606	
1879.857		144.95	2.170			

η Cassiopeæ = Σ. 60.

$\alpha = 0^h\ 41^m.7 \quad \delta = 57° \ 11'$ (4 and 8).

1878.859	21.6	154.5	5.28	3	383	
8.968	2.6	154.7	5.45	3	383	
1878.971	1.7	155.5	5.51	2	383	Through clouds.
1879.056	2.7	156.2	5.28	2	383	
9.061	3.2	160.8	5.24	2	383	Image very blazing.
9.064	2.6	156.0	5.42	2	383	Windy and unsteady.
9.081	3.9	160.2	5.30	2	383	Clouds.
1879.009		156.84	5.354			

65 Piscium = Σ. 61.

$\alpha = 0^h\ 43^m.4 \quad \delta = 27° \ 4'$ (6 and 6).

1875.979	1.0	112.0	4.67	3	383	
1875.989	1.0	113.6	4.51	3	383	
1876.896	0.0	295.3	4.56	2	383	
1876.929	0.3	117.5	4.55	2	383	
1877.076	2.7	118.2	4.47	3	383	
1877.085	2.7	115.4	4.58	2	383	
1876.659		115.33	4.557			

36 Andromedæ = Σ. 73.

$\alpha = 0^h\ 48^m.3$ $\delta = 22^\circ\ 58'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1875.979	1.5	3.1	1.39	2	383	Quite hazy.
1875.990	1.5	0.4	1.27	2	383	
1876.009	. .	356.4	1.24	3	383	
1876.011	. .	355.7	1.46	3	383	
1876.020	1.0	356.9	1.12	2	383	
1878.873	23.2	174.6	1.36	2	383	Images blurred.
1878.875	22.2	359.1	1.29	3	383	
1876.822		358.03	1.304			

Σ. 80.

$\alpha = 0^h\ 53^m.3$ $\delta = 0^\circ\ 9'$ (7 and 8).

1879.740	23.7	313.4	20.20	3	606	
9.754	23.6	313.7	20.23	3	606	
9.768	23.6	313.4	20.12	3	606	
1879.754		313.50	20.183			
	$\Delta p =$	0.00	+ 0.009			
		313.50	20.192			

Σ. 86.

$\alpha = 0^h\ 58^m.7$ $\delta = -6^\circ\ 7'$ (8 and 9).

1876.058	2.5	161.1	. .	2	383	Clouds.
6.066	3.0	159.5	13.12	3	383	
6.069	2.7	159.4	12.92	4	383	
1876.064		160.00	13.020			
	$\Delta p =$	− 0.01	+ 0.006			
		159.99	13.026			

201 Piscium.

$\alpha = 1^h\ 3^m.1$ $\delta = 23^\circ\ 9'$ (7 and 9).

1877.085	3.0	104.6	0.53	3	888	
7.090	2.7	104.7	0.60	3	888	
1877.088		104.65	0.565			

Σ. 113.

$\alpha = 1^h\ 13^m.7$ $\delta = -1^\circ\ 8'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.072	2.8	351.9	1.24	3	383	
6.085	2.5	351.0	1.26	3	383	
1876.078		351.45	1.250			

Anonyma.

$\alpha = 1^h\ 14^m.1$ $\delta = -16^\circ\ 25'$ (7 and 7).

1879.784	0.8	24.6	1.51	3	606	
9.787	0.4	23.0	1.59	2	383	
1879.786		23.80	1.550			

Σ. 118.

$\alpha = 1^h\ 20^m.6$ $\delta = 82^\circ\ 44'$ (8 and 10).

1879.853	23.4	73.1	11.90	3	606	
9.861	23.4	72.7	11.77	2	606	
1879.857		72.90	11.835			
	$\Delta p =$	− 0.07	+ 0.005			
		72.83	11.840			

Σ. 122.

$\alpha = 1^h\ 20^m.7$ $\delta = 2^\circ\ 55'$ (7 and 9).

1878.054	2.6	328.5	6.15	3	383	
8.068	2.8	327.4	5.99	3	383	The principal star not double.
1878.061		327.95	6.070			

Σ. 133. *A* and *B*.

$\alpha = 1^h\ 25^m.9$ $\delta = 35^\circ\ 13'$ (7 and 11).

1878.837	23.3	186.1	2.88	3	383	
8.845	23.8	183.7	3.10	3	383	
8.848	23.1	183.8	2.93	2	383	
1878.843		184.53	2.970			

Σ. 133. *A* and *C*. (7 and 11).

te.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
78.837	23.5	197.4	26.72	3	383	
8.845	23.9	197.5	26.71	3	383	
8.848	23.3	197.3	26.68	3	383	
		197.40	26.703			
		0.00	+ 0.007			
1878.843	Δp =	197.40	26.710			

Σ. 133. *C* and *D*. (11 and 12).

1878.837	23.7	168.7	5.06	3	383	
8.845	0.1	168.8	5.06	3	383	
8.848	23.5	169.1	5.06	3	383	
1878.843		168.87	5.060			

Σ. 138. *A* and *B*. (7 and 7).

α = 1h 30m.0 δ = 7° 0′

1875.989	2.0	34.1	1.51	3	383	
6.009	. .	32.1	1.38	3	383	
6.099	3.5	34.2	1.27	2	383	
1876.032		33.47	1.387			

Σ. 138. $\frac{A+B}{2}$ and *C*.

1875.989	2.2	62.3	22.50	2	383	*C* is 14th mag.
6.009	. .	63.4	22.00	2	383	*C* is 15th mag.
		62.85	22.250			
		0.00	+ 0.007			
1875.999	Δp =	62.85	22.257			

Σ. 155. (7 and 8).

α = 1h 37m.8 δ = 8° 51′

1876.099	4.2	326.9	4.71	3	383	
6.107	3.6	328.2	4.79	3	383	
1876.103		327.55	4.750			

Σ. 158.

$\alpha = 1^{h}\,39^{m}.8$ $\delta = 32^{\circ}\,35'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.784	1.1	257.1	2.09	3	606	
9.787	1.5	257.8	2.03	3	606	Cloudy.
1879.786		257.45	2.060			

Σ. 183. *A* and *B*.

$\alpha = 1^{h}\,48^{m}.3$ $\delta = 28^{\circ}\,13'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.894	23.3	6.9	0.49	2	888	
9.899	23.6	11.7	0.47	3	888	
9.907	23.8	12.3	0.51	2	888	
9.916	0.4	10.3	0.47	3	888	
1879.904		10.30	0.485			

Σ. 183. $\frac{A+B}{2}$ and *C*. (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.894	23.5	165.0	5.70	2*	888	
9.899	23.8	164.2	5.73	2	888	
1879.897		164.60	5.715			

Σ. 186.

$\alpha = 1^{h}\,49^{m}.7$ $\delta = 1^{\circ}\,15'$ (7 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.784	1.3	2.4	0.37	3	888	
9.916	1.0	1.7	0.30	3	888	
9.965	0.4	357.4	0.27	3	888	
1879.888		0.50	0.313			

Σ. 202.

$\alpha = 1^{h}\,55^{m}.8$ $\delta = 2^{\circ}\,11'$ (4 and 5).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.113	3.4	322.1	3.18	3	383	
6.118	3.2	322.4	3.10	3	383	
8.949	0.3	325.9	2.90	3	383	
8.952	1.8	325.2	3.04	2	383	
8.968	0.5	325.5	3.02	3	383	
1877.820		324.22	3.048			

γ^1 Andromedæ = Σ. 205 *A* and $\frac{B+C}{2}$.

$\alpha = 1^h\ 56^m.5$ $\delta = 41^\circ\ 46'$ (3 and 6).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1875.970	2.0	62.4	10.46	3	606	
5.979	1.0	62.8	10.54	3	383	
1875.974		62.60	10.500			
	Δ*p*	0.00	+ 0.003			
		62.60	10.503			

γ^2 Andromedæ = *O.* Σ. 38. (6 and 7).

1877.104	3.2	97.3	0.35	3	888	
7.109	. .	101.0	0.38	2	888	
7.112	3.1	104.6	0.37	2	888	
7.115	3.5	103.6	0.37	3	888	
1877.117	3.6	103.2	0.43	2	888	
1880.037	1.9	99.1	0.33	2	888	
0.039	2.0	95.8	0.35	2	888	
0.045	2.4	103.4	0.28	3	888	
1878.210		101.00	0.358			

Σ. 208.

$\alpha = 1^h\ 56^m.8$ $\delta = 25^\circ\ 22'$ (7 and 9).

1878.046	2.8	46.6	1.19	2	383	
8.051	3.0	45.5	1.27	2	383	
1878.048		46.05	1.230			

ι Trianguli = Σ. 227.

$\alpha = 2^h\ 5^m.4$ $\delta = 29^\circ\ 44'$ (5 and 6).

1877.076	3.2	76.9	3.62	3	383	
7.079	2.4	74.6	3.76	3	383	
7.082	2.4	77.7	3.99	2	383	Images much blurred.
7.085	2.4	77.6	3.70	3	383	
1877.080		76.70	3.768			

Σ. 228.

$\alpha = 2^h\ 6^m.3$ $\delta = 46°\ 55'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
·	h.	°	"			
1877.115	3.8	312.4	0.54	3	888	
7.117	3.9	313.9	0.53	2	888	
7.126	3.6	317.7	0.54	2	888	
7.128	3.7	310.3	0.55	3	888	
1877.121		313.58	0.540			

Lalande 4219.

$\alpha = 2^h\ 10^m.1$ $\delta = -18°\ 47'$ (8 and 9).

1879.918	1.2	311.7	2.20	3	383	
9.921	1.4	312.0	2.25	3	383	
1879.920		311.85	2.225			

ι Cassiopeæ = Σ. 262. *A* and *B*.

$\alpha = 2^h\ 19^m.2$ $\delta = 66°\ 52'$ (4 and 7).

1879.064	3.6	263.9	2.29	2	383	
9.083	3.8	260.1	2.01	3	383	
9.105	3.7	263.2	2.12	3	383	
1879.084		262.40	2.140			

ι Cassiopeæ. *A* and *C*. (4 and 8).

1879.064	3.8	107.7	7.39	2	383	
9.083	3.9	108.1	7.56	3	383	
9.105	3.8	110.9	7.54	2	383	
1879.084		108.90	7.497			

Σ. 295.

$\alpha = 2^h\ 35^m.1$ $\delta = -1°\ 12'$ (6 and 10).

1878.979	. .	325.3	4.79	2	383	
9.029	1.8	326.2	4.84	3	383	
9.050	2.5	323.8	4.89	2	383	
1879.019		325.10	4.840			

Σ. 296.

$\alpha = 2^h\ 35^m.9 \quad \delta = 48^\circ\ 43'$ (4 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.083	4.3	298.0	16.69	3	383	

107 Arietis.

$\alpha = 2^h\ 36^m.7 \quad \delta = 25^\circ\ 5'$ (7 and 11).

1875.989	. .	15.7	3.05	2	383	
6.009	. .	15.1	3.21	3	383	
6.020	2.5	16.2	3.05	3	383	
7.071	3.3	16.6	3.11	2	383	
7.074	2.4	15.9	2.99	3	383	
1876.433		15.90	3.082			This star was discovered by S. W. Burnham.

γ Ceti = Σ. 299.

$\alpha = 2^h\ 37^m.0 \quad \delta = 2^\circ\ 45'$ (3 and 7),

1876.031	. .	287.8	3.09	3	383	
6.033	2.5	286.4	3.06	3	383	
9.938	1.5	283.8	2.97	2	383	
9.948	1.5	285.8	3.04	2	323	
1877.988		285.95	3.040			

Lalande 5133.

$\alpha = 2^h\ 40^m.3 \quad \delta = 29^\circ\ 10'$ (8 and 11).

1876.039	. .	315.5	15.88	2	383	Comp. is 11 mag.
7.750	23.3	316.6	15.18	2	383	Images blazing.
7.753	1.0	315.6	15.24	2	383	
1877.181		315.90	15.433			
	$\Delta\rho =$	0.00	+ 0.006			
		315.90	15.439			This star was discovered by S. W. Burnham.

Σ. 305.

$\alpha = 2^h\ 40^m.7 \quad \delta = 18^\circ\ 52'$ (7 and 8).

1876.069	3.8	321.1	2.87	3	383	
6.072	3.5	320.3	2.66	3	383	
6.085	4.3	321.6	2.83	3	383	
1876.075		321.00	2.787			

Σ. 314.

$\alpha = 2^h\ 44^m.3$ $\delta = 52^\circ\ 30'$ (7 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1880.009	1.2	303.4	1.43	3	383	
0.022	1.5	303.6	1.49	3	383	
0.044	2.7	299.8	1.52	3	383	
1880.025		302.27	1.480			

Σ. 312. *A* and *B*.

$\alpha = 2^h\ 44^m.8$ $\delta = 72^\circ\ 26'$ (7 and 8).

1879.165	5.1	20.2	3.20	2	383	
9.995	0.9	21.5	3.18	2	383	
1879.580		20.85	3.190			

Σ. 312. *A* and *C*. (7 and 9).

1879.165	5.3	128.10	42.53	2	383	
9.995	1.1	128.48	42.65	2	383	
1879.580		128.29	42.590			
	$\Delta p =$	0.00	+ 0.014			
		128.29	42.604			

Σ. 326.

$\alpha = 2^h\ 48^m.5$ $\delta = 26^\circ\ 24'$ (8 and 10).

1879.853	2.5	216.4	8.43	3	606	
9.921	2.4	216.2	8.34	3	383	
1879.887		216.30	8 385			

ε Arietis = Σ. 333.

$\alpha = 2^h\ 52^m.3$ $\delta = 20^\circ\ 51'$ (5 and 6).

1876.066	4.0	200.8	(1.52)	2	383	Quadruple dist.; images blazing.
6.069	4.1	200.6	1.18	3	383	
6.072	4.0	201.8	1.14	2	383	
6.132	4.2	204.6	1.20	2	383	Images blurred.
1876.078		201.57	1.168			

Σ. 355.

$\alpha = 3^h\ 0^m.9 \quad \delta = 7^\circ\ 56'$ (9 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.948	3.0	146.3	2.81	3	383	
9.957	2.1	147.1	2.85	2	383	
1879.952		146.70	2.830			

Σ. 360.

$\alpha = 3^h\ 4^m.5 \quad \delta = 36^\circ\ 46'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.987	2.7	135.5	1.83	3	383	
1879.995	1.4	139.1	1.57	3	383	Haze.
1880.009	2.0	139.1	1.68	3	383	
1879.997		137.90	1.693			

12 Eridani.

$\alpha = 3^h\ 7^m.0 \quad \delta = -29^\circ\ 27'$ (4 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1878.068	3.3	311.9	. .	2	383	Driving clock stopped.
1880.009	3.3	314.5	2.54	2	383	
0.036	2.6	312.5	2.71	2	383	
0.039	3.1	307.7	2.55	2	383	
1879.538		311.65	2.600			

Σ. 367.

$\alpha = 3^h\ 7^m.9 \quad \delta = 0^\circ\ 18'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1878.046	3.2	246.6	0.70	2	606	
8.051	3.3	245.4	0.89	2	383	
1878.048		246.00	0.795			

Σ. 380.

$\alpha = 3^h\ 15^m.3 \quad \delta = 8^\circ\ 20'$ (9 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1880.009	3.5	73.9	1.27	3	606	
0.023	2.3	74.1	1.12	2	606	
1880.016		74.00	1.195			

Σ. 381.

$\alpha = 3^h\ 16^m.4 \quad \delta = 20^\circ\ 34'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.051	3.7	96.3	0.93	2	383	
8.100	3.6	96.1	0.78	3	383	
1878.076		96.20	0.855			

Σ. 389.

$\alpha = 3^h\ 20^m.5 \quad \delta = 58^\circ\ 57'$ (7 and 8).

1880.009	1.8	65.6	2.71	4	383	
0.022	1.7	65.5	2.72	3	383	
0.044	2.9	65.9	2.66	3	383	
1880.025		65.67	2.697			

Σ. 408.

$\alpha = 3^h\ 24^m.7 \quad \delta = -4^\circ\ 42'$ (8 and 8).

1878.079	3.4	340.1	1.23	2	383	
8.100	3.9	339.8	1.25	3	383	
1878.089		339.95	1.240			

Σ. 400.

$\alpha = 3^h\ 25^m.2 \quad \delta = 59^\circ\ 37'$ (7 and 8).

1879.165	5.6	302.1	0.68	2	606	
1880.009	1.5	301.6	0.72	3	606	
1879.587		301.85	0.700			

Σ. 412.

$\alpha = 3^h\ 27^m.2 \quad \delta = 24^\circ\ 3'$ (7 and 10).

1878.051	4.1	60.47	22.15	2	383	
8.073	2.8	60.20	22.41	2	383	Poor images and principal star not divided.
1878.062		60.33	22.280			
	$\Delta p =$	0.00	+ 0.006			
		60.33	22.286			

Σ. 422.

$\alpha = 3^h\ 30^m.6$ $\delta = 0^\circ\ 12'$ (6 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1880.009	3.7	242.0	6.51	4	383	
0.022	2.5	242.5	6.51	3	383	
0.036	2.8	241.2	6.40	2	383	
1880.022		241.90	6.473			

Weisse 564.

$\alpha = 3^h\ 32^m.0$ $\delta = -8^\circ\ 5'$ (9 and 10).

1876.009	. .	332.4	1.73	2	383	
6.031	. .	334.1	1.37	2	383	
6.033	3.0	332.1	1.86	3	383	
1876.024		332.87	1.653			This star was discovered by S. W. Burnham.

Σ. 460.

$\alpha = 3^h\ 50^m.0$ $\delta = 80^\circ\ 22'$ (5 and 6).

1879.108	4.8	29.2	0.93	2	888	Images blurred.
9.166	5.8	32.0	0.90	2	606	Images blurred.
1879.137		30.60	0.915			

O. Σ. 531.

$\alpha = 3^h\ 59^m.5$ $\delta = 37^\circ\ 46'$ (7 and 9).

1880.009	2.6	136.1	2.68	3	383	
0.022	2.0	137.8	2.57	3	383	
0.036	3.0	138.0	2.67	3	383	
1880.022		137.30	2.640			

Lalande 7655.

$\alpha = 4^h\ 1^m.3$ $\delta = 19^\circ\ 20'$ (8 and 11).

1876.033	3.5	278.2	5.86	3	383	
6.036	3.5	279.3	6.02	2	383	
1876.034		278.75	5.940			This star was discovered by S. W. Burnham.

Σ. 494.

$\alpha = 4^h\ 1^m.8 \qquad \delta = 22^\circ\ 46'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.096	3.8	186.4	5.27	2	383	
6.107	4.0	185.6	5.29	2	383	
6.113	3.8	186.4	5.27	3	383	
1876.105		186.13	5.277			

Σ. 511.

$\alpha = 4^h\ 7^m.9 \qquad \delta = 58^\circ\ 32'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.166	6.2	288.5	0.38	2	888	Images blurred.
1880.009	2.3	286.2	0.39	3	888	
0.044	3.2	286.7	0.42	3	888	
1879.854		286.82	0.400			

O. Σ. 78.

$\alpha = 4^h\ 8^m.5 \qquad \delta = 29^\circ\ 45'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1878.073	3.1	242.7	2.45	2	383	
8.079	4.0	245.8	2.45	2	383	
1878.076		244.25	2.450			This star was found independently by G. ANDERSON, 1878, January 26.

40 Eridani = Σ 518. *A* and *B*.

$\alpha = 4^h\ 9^m.8 \qquad \delta = -7^\circ\ 49'$ (4 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.174	5.6	105.60	81.91	2	383	
9.185	5.5	105.54	81.84	2	383	
1879.180		105.57	81.875			
	$\Delta\rho =$	0.00	+ 0.023			
		105.57	81.898			

40 Eridani. *A* and *D*. (4 and 12).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.185	5.9	136.6	36.32	2	383	D is 14th mag.
	$\Delta\rho =$	0.0	+ 0.01			
		136.6	36.33			

40 Eridani. *B* and *C*. (10 and 11).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.174	5.9	125.0	3.44	2	383	Clouds.
9.185	5.7	125.0	3.59	2	383	
1879.180		125.00	3.515			

Weisse 258.

$\alpha = 4^h\ 14^m.2$ $\delta = 39°\ 36'$ (8 and 12).

1876.039	. .	172.0	19.46	2	383	Comp. 12th mag.
1880.009	2.9	172.3	19.30	3	383	Comp. 13th mag.
1878.024		172.15	19.380			
	$\Delta\rho =$	0.00	+ 0.005			
		172.15	19.385			This star was discovered by S. W. Burnham.

Σ. 536.

$\alpha = 4^h\ 16^m.2$ $\delta = -4°\ 58'$ (8 and 9).

1880.009	4.0	161.0	1.90	3	606	
0.022	2.8	158.7	1.72	2	383	Faint; clouds.
0.036	3.3	160.9	1.88	2	383	
1880.022		160.20	1.833			

O. **Σ. 82.**

$\alpha = 4^h\ 15^m.9$ $\delta = 14°\ 46'$ (7 and 9).

1879.127	4.1	179.3	0.74	3	383	
9.185	6.4	185.2	0.79	2	606	Images blurred.
1879.156		182.25	0.765			

Σ. 535.

$\alpha = 4^h\ 16^m.7$ $\delta = 11°\ 5'$ (7 and 8).

1876.113	4.0	338.4	1.71	3	383	
6.118	3.4	338.4	1.68	3	383	
6.132	4.6	340.8	1.78	2	383	
1876.121		339.20	1.723			

O. Σ. 85.

$\alpha = 4^h\ 28^m.2$ $\delta = 48° 10'$ (8 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1880.044	3.5	27.6	1.40	3	888	
0.058	2.9	31.8	1.41	2	606	
1880.051		29.70	1.405			

Aldebaran.

$\alpha = 4^h\ 29^m.0$ $\delta = 16° 16'$ (1 and 15).

1877.994	2.3	110.55	30.69	2	383	Comp. 14.15 mag.
8.021	3.2	112.25	31.96	2	383	
8.046	4.1	109.55	31.20	3	383	Double weight.
1878.027		110.48	31.262			
	$\Delta p =$	0.00	+ 0.010			
		110.48	31.272			This faint companion was discovered by S. W. BURNHAM.

Σ. 567.

$\alpha = 4^h\ 29^m.5$ $\delta = 19° 14'$ (9 and 9).

1876.129	. .	317.0	1.76	3	383	
6.132	4.9	315.4	1.95	2	383	
6.135	4.0	317.6	1.81	3	383	
1876.132		316.67	1.840			

Σ. 566.

$\alpha = 4^h\ 30^m.5$ $\delta = 53° 15'$ (6 and 8).

1879.281	8.3	294.4	1.67	3	383	
9.305	8.9	294.4	1.55	3	383	
1879.293		294.40	1.610			

Σ. 572.

$\alpha = 4^h\ 31^m.1$ $\delta = 26° 42'$ (7 and 7).

1880.036	3.5	23.9	3.70	3	383	
0.039	3.3	26.0	3.49	2	383	
1880.038		24.95	3.595			

Σ. 577.

$\alpha = 4^h\ 34^m.1$ $\delta = 37^\circ\ 15'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.281	8.5	78.9	1.34	4	383	
9.305	9.2	79.1	1.60	3	383	
9.308	9.5	78.9	1.41	3	383	
1879.298		78.97	1.450			

Σ. 589.

$\alpha = 4^h\ 38^m.5$ $\delta = 5^\circ\ 4'$ (8 and 8).

1876.017	. .	299.0	4.65	3	383	
6.020	3.0	301.6	4.61	3	383	
6.099	4.8	299.6	4.55	2	383	
1876.045		300.07	4.603			

Lalande 9065.

$\alpha = 4^h\ 42^m.5$ $\delta = -21^\circ\ 0'$ (8 and 10).

1876.020	4.0	345.1	3.36	3	383	
6.033	4.0	346.3	3.33	3	383	
1876.026		345.70	3.345			This star was discovered by S. W. BURNHAM.

Lalande 9181.

$\alpha = 4^h\ 46^m.8$ $\delta = -5^\circ\ 29'$ (9 and 9.3).

1876.118	3.7	178.2	1.00	3	383	
6.129	. .	178.5	0.98	3	383	
1876.123		178.35	0.990			This star was discovered by S. W. BURNHAM.

O. Σ. 91.

$\alpha = 4^h\ 49^m.9$ $\delta = 3^\circ\ 0'$ (7 and 8).

1878.068	4.6	53.8	0.70	2	606	Clock running badly.
8.106	3.7	238.2	0.58	3	606	
1878.087		236.00	0.640			

Σ. 622.

$\alpha = 4^h\ 51^m.9$ $\delta = 1°\ 29'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1880.036	3.8	354.8	2.54	2	383	
0.039	3.6	354.7	2.41	3	383	
1880.038		354.75	2.475			

O. Σ. 92.

$\alpha = 4^h\ 52^m.1$ $\delta = 39°\ 13'$ (6 and 10).

1879.127	4.4	247.6	2.81	3	383	
9.220	6.8	246.7	2.81	2	383	
1879.174		247.15	2.810			

G. A. 1.

$\alpha = 4^h\ 58^m.0$ $\delta = 49°\ 0'$ (10 and 10.5)

1876.039	. .	337.8	5.55	2	383	This star was discovered by G. ANDERSON.

O. Σ. 95.

$\alpha = 4^h\ 59^m.5$ $\delta = 19°\ 41'$ (6 and 7).

1880.052	4.7	333.0	0.79	2	606	
0.058	4.4	336.1	0.93	2	888	
1880.055		334.55	0.860			

O. Σ. 98.

$\alpha = 5^h\ 1^m.3$ $\delta = 8°\ 20'$ (6 and 7).

1879.081	4.8	205.9	0.92	2	606	Images blurred.
9.127	4.7	205.7	0.86	3	383	
1879.104		205.80	0.890			

Σ. 634.

$\alpha = 5^h\ 2^m.8$ $\delta = 79°\ 5'$ (5 and 8).

1879.313	9.7	1.9	19.74	3	383	
9.316	10.2	1.6	19.75	2	383	Hazy.
1879.314		1.75	19.745			
	$\Delta\rho =$	+ 0.07	+ 0.006			
		1.82	19.751			

Anonyma.

$\alpha = 5^{h}\ 7^{m}.0$ $\delta = 1^{\circ}\ 50'$ (6 and 13).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.118	4.6	131.6	6.70	3	383	6 and 13 mags.
1880.036	4.4	137.7	6.77	2	383	14 mag.
1878.077		134.65	6.735			

τ Orionis. *A* and *B*.

$\alpha = 5^{h}\ 11^{m}.8$ $\delta = -6^{\circ}\ 58'$ (4 and 11).

1876.225	7.5	250.6	35.94	3	383	
6.228	7.3	249.6	36.03	3	383	
1876.226		250.10	35.985			
	$\Delta\rho =$	+ 0.02	+ 0.023			
		250.12	36.008			

τ Orionis. *A* and *D*. (4 and 12).

1876.225	7.2	59.6	35.98	3	383	
6.228	7.0	60.1	35.96	3	383	
1876.226		59.85	35.970			
	$\Delta\rho =$	+ 0.01	+ 0.023			
		59.86	35.993			

τ Orionis. *B* and *C*. (11 and 12).

1876.225	7.8	50.0	3.62	3	383	
6.228	7.7	47.3	4.06	2	383	Faint.
1876.226		49.10	3.767			

Σ. 676.

$\alpha = 5^{h}\ 13^{m}.1$ $\delta = 64^{\circ}\ 38'$ (7 and 9).

1880.058	2.4	270.8	1.01	2	606	
0.063	2.5	273.3	0.94	2	606	Images blurred.
0.066	2.8	270.3	1.07	2	606	
1880.062		271.47	1.007			

Σ. 677.

$\alpha = 5^h\ 13^m.4$ $\delta = 63° 16'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.281	8.8	259.8	1.58	4	383	
1879.305	9.5	260.4	1.51	3	383	
1880.044	4.3	259.1	1.50	3	606	
1879.543		259.77	1.530			

Σ. 694. *A* and *B*.

$\alpha = 5^h\ 16^m.6$ $\delta = 24° 51'$ (8 and 8).

1876.118	4.2	182.1	1.29	3	383	
6.129	. .	181.9	1.27	2	383	
6.132	5.3	183.7	1.22	3	383	
1876.126		182.57	1.260			

Σ. 694. $\frac{A+B}{2}$ and *C*.

1876.132	5.4	338.6	8.66	2	383	*C* is 15.16 mag.

η Orionis.

$\alpha = 5^h\ 18^m.4$ $\delta = -2° 31'$ (3 and 6).

1876.135	4.4	83.8	1.11	2	383	Images blurred.
6.189	5.9	85.6	1.02	2	606	Images blurred.
1876.162		84.70	1.065			

Oel. Arg. S. 3957.

$\alpha = 5^h\ 21^m.3$ $\delta = -20° 49'$ (8 and 11).

1876.072	4.5	231.8	3.78	2	383	Images blurred.
6.085	4.6	230.9	3.98	3	383	
6.113	4.8	231.5	4.07	3	383	
1876.094		231.32	3.976			This star was discovered by S. W. Burnham.

118 Tauri = Σ. 716.

$\alpha = 5^h\ 21^m.9$ $\delta = 15° 3'$ (7 and 8).

1876.129	. .	200.2	5.12	2	383	
6.135	5.2	198.3	5.07	3	383	
6.176	5.8	196.3	4.97	2	383	
6.187	5.9	198.1	5.00	3	383	
1876.157		198.22	5.040			

β Leporis.

$\alpha = 5^h\ 23^m.1$ $\delta = -20°\ 51'$ (3 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1876.085	5.0	280.4	3.16	3	383	Comp. 10.5 mag.
6.132	5.7	283.6	. .	2	383	Images blurred.
6.135	4.7	279.0	3.08	3	383	
7.115	5.5	284.0	3.20	3	383	
7.117	5.3	286.1	3.21	2	383	
7.129	5.3	284.7	3.07	3	383	
1879.949	5.7	281.1	3.08	2	383	
1880.009	4.3	281.5	3.02	3	383	Comp. 11th mag.
1877.459		282.55	3.117			This star was discovered by S. W. Burnham.

Σ. 735.

$\alpha = 5^h\ 27^m.0$ $\delta = -6°\ 35'$ (8 and 9).

1876.099	5.8	352.6	37.84	2	383	
6.107	5.1	352.9	37.93	2	383	
1876.103		352.75	37.885			
	$\Delta p =$	0.00	+ 0.021			
		352.75	37.906			

λ Orionis = Σ. 738.

$\alpha = 5^h\ 28^m.5$ $\delta = 9°\ 51'$ (4 and 6).

1876.135	5.5	45.0	4.57	3	383	
6.176	6.2	45.1	4.51	2	383	
6.187	6.4	41.6	4.92	2	383	Image much blurred.
6.189	6.3	42.5	4.46	3	383	
1876.170		43.83	4.571			

Σ. 742.

$\alpha = 5^h\ 29^m.2$ $\delta = 21°\ 55'$ (7 and 8).

1876.069	5.3	256.2	3.58	2	383	Images diffuse.
6.072	5.0	252.6	3.74	3	383	
6.107	4.7	254.0	3.53	3	383	
1876.083		254.27	3.617			

ζ Orionis = Σ. 774.

$\alpha = 5^h\ 34^m.7 \quad \delta = -\ 2^\circ\ 0'$ (2 and 6).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.176	6.6	157.0	2.78	2	383	Image much blurred.
6.189	6.8	156.8	2.70	2	383	
1876.185		156.87	2.727			

Σ. 787.

$\alpha = 5^h\ 38^m.8 \quad \delta = 21^\circ\ 16'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1880.053	5.1	70.6	1.12	2	606	
0.058	4.6	71.4	1.30	2	606	
1880.056		71.00	1.210			A 14th mag. star $p = 50^\circ$; $s = 11''$, by estimation.

G. A. 2.

$\alpha = 5^h\ 47^m.0 \quad \delta = -\ 20^\circ\ 0'$ (8 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.069	4.8	18.7	9.01	2	383	
6.113	5.3	20.1	9.20	2	383	
1876.091		19.40	9.105			This star was discovered by G. Anderson.

41 Aurigæ = Σ. 845.

$\alpha = 6^h\ 2^m.4 \quad \delta = 48^\circ\ 44'$ (5 and 6).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.308	9.2	353.9	7.85	3	383	
9.313	9.3	354.1	7.88	2	383	
9.316	9.9	353.6	7.86	3	383	
1879.312		353.87	7.863			

Σ. 853.

$= 6^h\ 2^m.5 \quad \delta \quad 11^\circ\ 41'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.113	5.5	348.9	27.04	3	383	Clouds.
6.118	6.1	348.8	26.97	3	383	
1876.116		348.85	27.005			
	$\Delta p =$	0.00	+ 0.010			
		348.85	27.015			

Lalande 11915.

$\alpha = 6^h\ 8^m.7$ $\delta = -1^\circ\ 41'$ (8 and 9).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1876.170	6.1	92.7	2.18	2	383	
6.173	5.6	93.5	2.16	2	383	
1876.172		93.10	2.170			This star was discovered by S. W. Burnham.

Σ. 881.

$\alpha = 6^h\ 11^m.4$ $\delta = 59^\circ\ 26'$ (6 and 8).

1879.280	9.0	102.2	0.67	3	606	
9.305	9.8	101.3	0.80	2	606	
9.308	10.0	100.1	0.85	2	606	
1879.298		101.20	0.773			

G. A. 3. *A* and *B*.

$\alpha = 6^h\ 24^m.0$ $\delta = 5^\circ\ 0'$ (8.9 and 13.14).

1876.173	7.0	282.4	3.66	3	383	

G. A. 3. *A* and *C*. (8.9 and 14.15).

1876.173	6.8	319.8	7.20	2	383	

G. A. 3. *A* and *D*. (8.9 and 13).

1876.173	7.2	288.4	12.64	3	383	

G. A. 3. *A* and *E*. (8.9 and 12.13).

1876.173	7.4	197.5	13.28	3	383	This star was discovered by G. Anderson.

Σ. 932.

$\alpha = 6^h\ 27^m.5$ $\delta = 14^\circ\ 50'$ (8 and 9).

1876.058	4.7	331.5	2.28	2	383	
6.072	5.3	334.3	2.30	3	383	
6.096	6.4	332.6	2.11	2	383	Bad images.
1876.075		332.80	2.230			

Σ. 945.

$a = 6^h\ 31^m.9$ $\delta = 41°\ 7'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1880.044	4.6	262.6	1.00	2	606	
0.058	3.7	265.4	0.89	2	888	
1880.051		264.00	0.945			

Σ. 950.

$a = 6^h\ 34^m.4$ $\delta = 10°\ 1'$ (6 and 9).

1876.058	5.0	210.9	3.02	2	383	
6.072	5.8	211.5	3.08	3	383	
6.113	6.0	215.3	3.06	3	383	
1876.081		212.57	3.053			

Σ. 955. *A* and *B*.

$a = 6^h\ 35^m.4$ $\delta = -7°\ 53'$ (9 and 9).

1879.081	5.5	269.3	0.82	2	606	
9.193	7.5	272.5	0.74	2	606	
9.196	6.1	269.3	0.78	3	606	
1879.157		270.37	0.780			

Σ. 955. $\frac{A+B}{2}$ and *C*. (9 and 9).

1879.081	5.7	189.2	11.60	2	606	
9.193	7.7	188.4	11.61	2	606	
9.196	6.2	188.8	11.45	3	606	
1879.157		188.80	11.553			
	$\Delta\rho =$	0.00	+ 0.007			
		188.80	11.560			

Σ. 948. *A* and *B*.

$a = 6^h\ 35^m.6$ $\delta = 59°\ 34'$. (6 and 7).

1879.280	9.3	131.4	1.54	2	383	
9.305	10.1	131.1	1.60	3	383	
9.308	10.2	130.2	1.74	3	383	
1879.298		130.90	1.627			

. 948. *A* and *C*. (6 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.280	9.4	307.2	8.66	2	383	
9.305	10.3	305.0	8.72	2	383	
9.308	10.4	305.2	8.61	3	383	
1879.298		305.80	8.663			

Sirius.

$\alpha = 6^h\ 39.^m9$ $\delta = -\ 16°\ 33'$ (1 and 13).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.128	. .	115.0	70.46	2	383	s uncertain; ½ wt.
7.164	6.8	114.9	72.09	2	383	Comp. 13th mag.
7.936	6.4	114.9	71.08	3	383	
1877.466		114.92	71.36			
	Δp =	− 0.01	+ 0.03			
		114.91	71.39			This faint companion was discovered by A. MARTH.

O. Σ. 159.

$\alpha = 6^h\ 46^m.9$ $\delta = 58°\ 34'$ (5 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.308	10.7	1.8	0.44	2	888	
9.313	10.0	3.1	0.49	3	888	
9.319	9.3	4.6	0.41	3	888	
1879.313		3.17	0.447			

38 Geminorum = Σ. 982.

$\alpha = 6^h\ 47^m.9$ $\delta = 13°\ 20'$. (6 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.113	6.4	162.8	6.42	2	383	Images blurred.
6.118	6.4	164.3	6.34	3	383	
6.129	. .	165.3	6.42	2	383	Images blurred.
6.135	6.3	162.8	6.37	3	383	
1876.125		163.72	6.377			

Lalande 13404.

$\alpha = 6^h\ 49^m.9$ $\delta = 2°\ 28'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.170	6.4	62.4	1.23	2	383	Images bad; clouds.
6.173	5.9	63.6	1.23	2	383	Images blurred.
1876.172		63.00	1.230			This star was discovered by S. W. BURNHAM.

O. Σ. 165.

$\alpha = 7^h\ 1^m.5$ $\delta = 16°\ 8'$ (5 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.185	6.9	75.8	2.96	2	606	
9.193	8.1	71.1	3.01	2	383	Comp. 13th mag.
9.196	6.4	72.5	2.97	3	383	
1879.191		73.13	2.980			

Σ. 1037.

$= 7^h\ 5^m.3$ $\delta = 27°\ 26'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.118	7.0	308.8	1.34	2	383	
6.135	6.7	314.9	1.18	3	383	
6.200	. .	311.2	1.30	2	383	
1876.151		311.63	1.273			There is a faint companion of 13th mag.; $p = 100°$: $s = 12''$ by estimation.

Σ. 1066.

$\alpha = 7^h\ 12^m.8$ $\delta = 22°\ 11'$ (3 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.185	7.3	206.6	7.10	2	606	
9.193	8.4	206.0	7.13	2	383	
9.196	6.6	203.7	7.13	3	383	
1879.191		205.43	7.120			

Σ. 1093.

$\alpha = 7^h\ 21^m.2$ $\delta = 50°\ 13'$ (9 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1880.044	4.9	126.7	0.86	2	606	
0.058	4.0	129.0	0.78	2	888	
1880.051		127.85	0.820			

O. Σ. 175.

$\alpha = 7^h\ 26^m.8$ $\delta = 31°\ 13'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.231	7.2	333.6	0.58	3	888	
1880.058	5.0	330.5	0.74	2	606	Images blurred.
1880.129	5.8	330.8	0.58	3	888	
1879.756		331.86	0.612			

Castor = Σ. 1110.

$\alpha = 7^h\ 26^m.9$ $\delta = 32°\ 9'$ (2 and 3).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.235	8.3	237.2	5.83	3	383	Clouds.
8.270	8.6	235.2	5.85	2	383	
8.309	9.5	235.5	5.85	2	383	
1879.108	5.7	233.4	5.70	2	383	
9.127	5.4	234.0	5.76	2	383	
9.174	6.6	232.6	5.65	2	383	Clouds.
9.196	5.5	231.7	5.65	2	383	
1878.774		234.23	5.756			

Procyon.

$\alpha = 7^h\ 33^m.0$ $\delta = 5°\ 32'$.

The apparent variable proper motion of this star has led astronomers to make careful searches for close companions, and several such have been discovered. An account of these discoveries will be found in the *Astronomische Nachrichten*, No. 2080, and in the Proceedings of the American Academy of Arts and Sciences, Boston, Massachusetts, Vol. XI, p. 185.

I have never been able to see any of these companions that would stand the test of sliding and changing the eye-piece, turning the micrometer, &c., and am therefore doubtful of their existence. This is an interesting star for the powerful telescopes of the future.

Σ. 1126.

$\alpha = 7^h\ 33^m.7$ $\delta = 5°\ 31'$ (7 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.097	5.2	141.9	1.25	2	606	
9.108	6.2	141.2	1.22	3	383	
9.185	7.5	143.5	1.18	2	606	
1879.130		142.20	1.217			

O. Σ. 179.

$\alpha = 7^h\ 37^m.2$ $\delta = 24°\ 41'$ (4 and 9).

1879.097	5.9	232.8	6.40	2	383	
9.108	6.0	232.7	6.49	3	383	
9.185	7.8	237.6	6.47	2	606	
1879.130		234.37	6.453			

Σ. 1136.

$\alpha = 7^h\ 41^m.6$ $\delta = 65^\circ\ 15'$ (7 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.281	10.1	238.9	9.24	2	383	
9.305	10.6	240.7	9.19	2	383	
1879.293		239.80	9.215			

ρ Argus.

$\alpha = 7^h\ 46^m.2$ $\delta = -13^\circ\ 33'$ (5 and 7).

1879.231	7.4	297.3	0.43	2	888	Uncertain.
1880.129	6.6	315.1	0.34	2	888	Doubtful.
1879.680		306.2	0.385			

Σ. 1187.

$\alpha = 8^h\ 1^m.9$ $\delta = 32^\circ\ 35'$ (7 and 8).

1879.097	6.2	48.1	1.91	3	383	
9.108	6.4	48.2	2.03	3	383	
9.190	7.3	53.5	1.82	2	383	Hazy.
9.196	6.8	50.4	2.02	3	383	
1879.148		50.05	1.945			

ζ Cancri = Σ. 1196. *A* and *B*.

$\alpha = 8^h\ 5^m.3$ $\delta = 18^\circ\ 1'$ (6 and 7).

1878.311	9.9	104.0	0.68	2	606	
8.317	10.4	101.7	1.02	2	383	
8.328	10.3	101.2	0.74	2	383	
1878.319		102.30	0.813			

ζ Cancri. $\frac{A+B}{2}$ and *C*. (6 and 7).

1878.311	10.0	131.4	5.44	2	606	
8.317	10.6	128.9	5.42	2	383	
8.328	10.4	131.0	5.23	2	383	
1878.319		130.43	5.363			

φ^2 **Cancri = Σ. 1223.**

$\alpha = 8^h\ 19^m.5 \quad \delta = 27^\circ\ 20'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.311	10.4	216.1	4.98	3	383	
8.317	11.0	216.2	4.97	2	383	Images blurred.
8.328	10.8	216.2	5.03	2	383	
1878.319		216.16	4.998			

υ' **Cancri = Σ. 1224.**

$\alpha = 8^h\ 19^m.6 \quad \delta = 24^\circ\ 56'$ (6 and 7).

1878.311	11.1	42.7	5.85	2	383	
8.317	11.4	42.9	5.93	2	383	
8.328	11.2	42.9	5.79	2	383	
1878.319		42.83	5.857			

Σ. 1263.

$\alpha = 8^h\ 37^m.3 \quad \delta = 42^\circ\ 9'$ (8 and 8).

1877.337	10.9	19.16	39.02	2	383	
	$\Delta\rho$	+ 0.01	+ 0.01			
		19.17	39.03			

ε **Hydræ = Σ. 1273.** *A* and *B*.

$\alpha = 8^h\ 40^m.4 \quad \delta = 6^\circ\ 51'$ (4 and 8).

1878.330	9.9	224.8	3.38	3	383	
8.333	10.0	223.5	3.22	2	383	
8.336	10.2	225.2	3.35	2	383	
1878.333		224.50	3.317			

ε **Hydræ.** *A* and *C*. (4 and 14).

1878.330	10.2	193.9	19.78	3	383	14th mag.; *C* visible in twilight.

O. Σ. **196.**

$\alpha = 8^h\ 50^m.9 \quad \delta = 48^\circ\ 30'$ (4 and 12).

1879.281	10.4	358.1	9.74	2	383	
9.305	10.8	356.5	9.49	2	383	
1879.293		357.30	9.615			

Σ. 1300.

$\alpha = 8^h\ 54^m.7$ $\delta = 15^\circ\ 44'$ (9 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.193	8.7	202.3	4.78	2	383	
9.196	8.2	201.3	4.85	2	383	
1879.194		201.80	4.815			

Σ. 1306.

$\alpha = 8^h\ 59^m.8$ $\delta = 67^\circ\ 37'$ (5 and 9).

1879.313	10.5	244.6	2.40	2	888	
9.319	9.6	243.6	2.43	3	888	
1879.316		244.10	2.415			

O. Σ. 197.

$\alpha = 9^h\ 3^m.3$ $\delta = 3^\circ\ 28'$ (7 and 9).

1879.199	6.8	60.1	1.35	2	606	
9.212	8.2	61.1	1.33	3	383	
9.215	7.7	60.2	1.40	2	383	Images blurred.
1879.207		60.52	1.352			

Lalande 18231.

$\alpha = 9^h\ 8^m.8$ $\delta = 4^\circ\ 40'$ (9.5 and 10.5).

1877.296	10.6	67.1	1.96	3	383	
7.312	10.6	63.4	1.93	2	383	
1877.304		65.25	1.945			This star was discovered by S. W. Burnham.

Σ. 1329.

$\alpha = 9^h\ 9^m.6$ $\delta = -0^\circ\ 42'$ (8 and 8).

1879.199	7.1	67.75	22.49	2	383	Hazy.
9.215	7.4	67.80	22.56	2	383	
1879.207		67.78	22.525			
	$\Delta\rho =$	0.00	+ 0.007			
		67.78	22.532			

Σ. 1331.

$a = 9^h\ 11^m.5$ $\delta = 61°\ 50'$ (8 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.314	10.8	153.9	0.94	2	888	
9.319	9.9	154.6	0.83	2	888	
9.393	12.2	152.2	0.86	3	606	
1879.342		153.57	0.877			

Σ. 1338.

$a = 9^h\ 13^m.5$ $\delta = 38°\ 42'$ (7 and 7).

1879.212	7.9	151.2	1.62	3	383	
9.215	7.1	152.9	1.57	2	383	
9.220	7.1	149.8	1.54	2	383	
1879.216		151.30	1.577			

Burnham 105.

$a = 9^h\ 16^m.0$ $\delta = 26°\ 30'$ (5 and 11).

1878.330	10.6	204.4	2.87	3	383	
8.333	10.4	203.2	2.90	2	383	
1878.332		203.80	2.885			

O. Σ. 200.

$a = 9^h\ 16^m.6$ $\delta = 52°\ 5'$ (6 and 8).

1879.313	11.4	336.9	1.53	3	383	
9.319	10.5	340.4	1.47	3	383	
9.393	12.5	338.8	1.30	3	383	
1879.342		338.70	1.433			

O. Σ. 201.

$a = 9^h\ 16^m.8$ $\delta = 28°\ 26'$ (7 and 11).

1879.385	12.0	229.1	1.28	3	383	
9.387	12.5	227.3	1.31	2	383	
1879.386		228.20	1.295			

Σ. 1348.

$= 9^h\ 18^m.2$ $\delta = 6^\circ\ 49'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.212	8.5	325.2	1.68	2	383	
9.215	9.5	327.6	1.68	2	383	
9.220	7.4	324.2	1.47	2	383	Blurred images.
1879.215		325.96	1.638			

Σ. 1355.

$\alpha = 9^h\ 21^m.2$ $\delta = 6^\circ\ 48'$ (7 and 7).

1878.350	11.0	328.1	2.78	3	383	
8.355	11.4	331.0	2.80	2	383	
9.215	9.2	153.6	2.60	3	383	
9.220	7.6	332.3	2.74	2	383	
1878.785		331.25	2.730			

ω Leonis.

$\alpha = 9^h\ 22^m.0$ $\delta = 9^\circ\ 35'$ (6 and 7).

1878.336	10.5	73.8	0.46	2	888	
8.350	10.7	78.0	0.46	2	888	
9.231	6.8	70.5	0.41	3	888	
9.253	7.7	74.1	0.36	3	888	
9.256	8.1	75.6	0.42	2	888	Windy.
9.264	7.9	74.3	0.38	3	888	
1878.948		74.38	0.415			

O. Σ. 205.

$\alpha = 9^h\ 35^m.0$ $\delta = 41^\circ\ 31'$ (8 and 10).

1879.229	8.1	199.4	11.88	2	383	Comp. 14th mag.
9.231	. .	199.2	11.86	3	383	
1879.230		199.30	11.870			

Σ. 1377.

$\alpha = 9^h\ 37^m.2$ $\delta = 3^\circ\ 11'$ (8 and 11).

1879.327	10.2	139.7	3.79	2	383	
9.330	10.4	140.3	3.71	2	383	Very unsteady.
1879.328		140.00	3.750			

Σ. 1389.

$\alpha = 9^{h}\ 45.^{m}5 \quad \delta = 27^{\circ}\ 33'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.229	8.4	316.0	2.07	2	383	
9.231	8.0	315.6	2.07	3	383	
9.248	8.2	317.2	2.06	2	383	Very windy.
1879.236		316.27	2.067			

Σ. 1386.

$\alpha = 9^{h}\ 45^{m}.6 \quad \delta = 69^{\circ}\ 28'$ (8 and 8).

1879.338	10.7	292.6	1.84	2	333	Cloudy.
9.393	12.8	114.8	1.80	3	383	
9.396	12.4	294.8	2.00	2	383	Images blurred.
1879.372		293.92	1.856			

8 Sextantis.

$\alpha = 9^{h}\ 46^{m}.6 \quad \delta = -\ 7^{\circ}\ 32'$ (5 and 6).

1879.231	8.3	297.5	0.31	1	888	Observations uncertain.
9.264	8.1	. .	. .	3	888	Not seen double.

Σ. 1400.

$\alpha = 9^{h}\ 53^{m}.0 \quad \delta = 69^{\circ}\ 23'$ (7 and 10).

1879.313	11.7	227.7	2.39	3	383	Mags. 8th and 11th.
9.338	11.1	227.5	. .	2	383	Clouds.
9.393	13.1	224.7	2.59	2	383	Mags. 8th and 12th.
1879.348		226.63	2.490			This star was observed by mistake for Σ 1386.

A Leonis.

$\alpha = 10^{h}\ 1^{m}.5 \quad \delta = 10^{\circ}\ 35'$ (5 and 15).

1876.359	. .	39.5	. .	2	383	Very faint; ½ wt.
6.362	. .	43.8	7.48	3	383	15th mag.
9.220	9.8	44.8	8.04	2	383	
9.231	8.6	44.4	8.14	3	383	
9.385	12.3	42.0	8.12	3	383	This companion was discovered by G. ANDERSON, April 22, 1876. It is a 15th or 16th magnitude star.
1878.306		43.28	7.945			

α Leonis, Comp.

$\alpha = 10^h\ 2^m.0 \quad \delta = 12° \ 33'$ (8 and 14).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.244	. .	86.0	. .	3	383	Clouds; 15th mag.
6.250	. .	87.8	3.25	2	383	15th–16th mag.
6.307	. .	83.2	3.14	3	383	Comp. well seen; 14th–15th.
9.220	10.2	92.9	3.70	2	383	
9.231	8.8	85.1	3.52	3	383	
9.270	8.7	83.5	3.56	3	383	This companion was discovered by Professor WINLOCK with the 15-inch refractor of the Harvard College Observatory. It is about the 15th magnitude.
1877.754		86.42	3.434			

O. Σ. 215.

$\alpha = 10^h\ 9^m.8 \quad \delta = 18° \ 20'$ (6 and 7).

1879.231	9.3	222.0	0.64	2	888	
9.253	8.6	220.2	0.61	3	606	
9.264	8.3	222.9	0.64	3	888	
1879.249		221.70	0.630			

39 Leonis.

$\alpha = 10^h\ 10^m.7 \quad \delta = 23° \ 42'$ (6 and 11).

1878.336	10.8	299.9	7.02	3	383	
9.264	8.6	299.9	7.11	3	383	
9.270	8.4	300.8	7.18	3	383	
1878.957		300.20	7.103			

γ Leonis.

$\alpha = 10^h\ 13^m.3 \quad \delta = 20° \ 27'$ (3 and 4).

1877.312	10.9	111.5	3.54	1	383	Extremely poor images.
7.408	12.5	111.8	3.75	2	383	
8.350	11.4	112.9	3.40	2	383	
8.380	11.2	112.4	3.48	2	383	
8.391	11.9	110.2	3.57	2	383	Images blazing.
9.231	9.5	116.4	3.52	2	888	Images blazing.
9.253	8.9	115.7	3.58	2	383	
9.256	8.4	112.8	3.59	2	383	Windy.
9.264	8.8	114.7	3.35	3	383	
9.270	8.0	115.5	3.44	2	383	The observations of this star were generally made with difficulty, since the images were nearly always blazing and unsteady.
1878.612		113.39	3.522			

Σ. 1426. *A* and *B*.

$\alpha = 10^{h}\ 14^{m}.2 \quad \delta = 7^\circ\ 2'$ (7 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1876.362	. .	276.3	0.72	3	383	
6.367	. .	277.6	0.60	2	606	
1876.364		276.95	0.660			

$\frac{A+B}{2}$ and C. (7 and 10).

1876.362	. .	9.3	7.81	3	383	
6.367	. .	10.5	8.03	2	383	
1876.364		9.90	7.920			

$\frac{A+B}{2}$ and D.

1876.362	. .	45.2	34.39	3	383	*D* is 15th mag.

Σ. 1428.

$\alpha = 10^{h}\ 18^{m}.4 \quad \delta = 53^\circ\ 14'$ (7 and 8).

1879.393	13.5	86.7	3.56	2	383	
9.434	13.0	87.3	3.56	3	383	
1879.414		87.00	3.560			

Σ. 1429.

$\alpha = 10^{h}\ 18^{m}.4 \quad \delta = 25^\circ\ 12'$ (8 and 8).

1879.327	10.5	81.7	0.89	3	383	
9.333	10.3	82.3	0.87	3	383	
1879.330		82.00	0.880			

Σ. 1439.

$\alpha = 10^{h}\ 23^{m}.7 \quad \delta = 21^\circ\ 24'$ (8 and 9).

1879.229	8.8	121.3	1.80	2	383	
9.231	9.0	121.8	1.79	3	383	
9.253	8.0	121.0	1.95	3	606	Clock going badly.
1879.238		121.37	1.847			

Σ. 1450.

$\alpha = 10^h\ 28^m.7$ $\delta = 9^\circ\ 17'$ (6 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.328	11.6	159.8	2.44	2	383	
8.330	11.9	159.8	2.36	3	383	
1878.329		159.80	2.400			

Σ. 1457.

$\alpha = 10^h\ 32^m.5$ $\delta = 6^\circ\ 22'$ (7 and 9).

1878.333	11.6	310.2	1.13	2	606	
8.336	11.8	312.6	1.19	2	383	
1878.334		311.40	1.160			

O. Σ. 228.

$\alpha = 10^h\ 40^m.7$ $\delta = 23^\circ\ 12'$ (7 and 8).

1879.327	10.8	196.1	0.30	3	888	
9.385	12.8	189.9	0.35	2	888	
9.406	12.4	198.4	0.37	2	888	
1879.373		194.80	0.340			

O. Σ. 229.

$\alpha = 10^h\ 41^m.1$ $\delta = 41^\circ\ 44'$ (6 and 7).

1879.264	9.1	331.4	0.79	3	606	
9.278	9.2	330.6	0.77	2	606	Blurred images.
9.333	10.0	333.1	0.71	2	606	
1879.294		331.92	0.754			

Σ. 1487.

$\alpha = 10^h\ 49^m.1$ $\delta = 25^\circ\ 25'$ (5 and 7).

1879.231	9.8	106.9	6.44	3	383	
9.253	9.2	107.6	6.30	2	383	
9.256	8.7	107.0	6.58	2	383	Windy; difficult to observe.
1879.245		107.20	6.412			

Σ. 1500.

$\alpha = 10^{h}\ 53^{m}.9$ $\delta = -2^{\circ}\ 50'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.350	12.0	312.5	1.40	3	606	
8.355	11.7	315.0	1.32	2	383	
1878.352		313.75	1.360			

Σ. 1504.

$\alpha = 10^{h}\ 57^{m}.8$ $\delta = 4^{\circ}\ 17'$ (8 and 8).

1878.330	12.2	105.1	1.11	3	383	
8.333	10.8	102.9	1.15	2	383	
1878.332		104.00	1.130			

Σ. 1517.

$\alpha = 11^{h}\ 7^{m}.4$ $\delta = 20^{\circ}\ 47'$ (7 and 7).

1876.395	. .	100.8	0.53	3	888	Mags. 9 and 9.5.
6.398	. .	96.8	0.48	3	888	
1876.396		98.80	0.505			This star was rediscovered by Mr. A. G. Clark April 21, 1876.

Σ 1516. *A* and *B*.

$\alpha = 11^{h}\ 7^{m}.6$ $\delta = 74^{\circ}\ 7'$ (7 and 8).

1879.393	14.0	91.8	10.37	3	383	
9.434	13.3	92.3	10.64	3	383	
1879.414		92.05	10.505			
	$\Delta\rho =$	− 0.03	+ 0.004			
		92.02	10.509			

A and *C*. (7 and 13).

1879.393	14.1	298.5	7.56	2	383	*C* is 13th mag.
9.434	13.5	297.9	7.76	3	383	
1879.414		298.20	7.660			

ξ Ursæ Majoris.

$\alpha = 11^h\ 11^m.8$ $\delta = 32^\circ\ 13'$ (4 and 5).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	''			
1877.408	13.4	294.5	. .	1	383	Images extremely poor.
7.410	14.5	294.4	2.10	2	383	Blazing images.
9.253	9.6	283.7	1.94	2	383	Blurred images.
9.264	9.3	283.8	1.77	3	606	
9.270	10.3	283.7	1.71	3	383	
9.278	9.5	285.1	1.98	2	383	Blurred images.
1878.802		286.59	1.854			

ι Leonis.

$\alpha = 11^h\ 17^m.6$ $\delta = 11^\circ\ 12'$ (4 and 8).

1876.387	. .	70.3	2.73	3	383	
6.398	. .	69.4	2.81	3	606	
9.264	9.5	66.4	2.65	2	606	
9.278	8.7	68.0	2.81	2	383	
1877.832		68.52	2.750			

57 Ursæ Majoris.

$\alpha = 11^h\ 22^m.6$ $\delta = 40^\circ\ 0'$ (6 and 8).

1877.408	13.6	183.5	5.60	2	383	
7.410	14.8	1.3	5.35	2	383	
1877.409		2.40	5.475			

O. Σ. 235.

$\alpha = 11^h\ 25^m.4$ $\delta = 61^\circ\ 45'$ (6 and 8).

1879.434	13.8	54.6	1.12	3	888	
9.439	13.1	57.1	1.01	3	888	
9.450	13.9	54.8	1.07	2	888	
1879.441		55.50	1.067			

Σ. 1555.

$\alpha = 11^h\ 30^m.0$ $\delta = 28^\circ\ 27'$ (6 and 6).

1879.327	11.2	166.8	0.60	2	888	
9.333	10.5	162.0	0.76	2	383	
1879.330		164.40	0.680			

Lalande 22020.

$a = 11^h\ 30^m.8$ $\delta = -\ 11^\circ\ 41$ (10 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	″				
1877.334	11.8	67.9	0.70	2	606	10th mag.
7.364	11.1	68.5	0.59	2	606	Both 10th mag.
1877.349		68.20	0.645			This star was discovered by S. W. Burnham.

O. Σ. 237.

$a = 11^h\ 32^m.5$ $\delta = 41^\circ\ 49'$ (8 and 9).

1879.385	13.4	272.1	1.16	2	606	
9.387	12.8	272.6	0.95	2	383	
9.390	11.9	269.6	0.99	2	606	
1879.387		271.43	1.033			

Oeltzen — Arg. 11836.

$a = 11^h\ 55^m.5$ $\delta = -\ 20^\circ\ 53'$ (8 and 9).

1877.364	11.4	84.9	0.84	2	606	
7.369	11.4	83.6	0.94	2	606	
1877.366		84.25	0.890			This star was discovered by S. W. Burnham.

Σ. 1594.

$a = 11^h\ 57^m.3$ $\delta = 42^\circ\ 3'$ (9 and 10).

1879.387	13.2	160.6	15.48	2	383	
9.434	14.0	160.4	15.42	3	383	
1879.410		160.50	15.450			
	$\Delta p =$	0.00	+ 0.004			
		160.50	15.454			A companion following; ($p = 90^\circ$, $s = 20''$, by est.) and of 13th mag.

Σ. 1606.

$a = 12^h\ 4^m.7$ $\delta = 40^\circ\ 34'$ (6 and 7).

1879.327	11.6	341.4	1.28	2	606	
9.333	10.8	339.2	1.12	2	383	
1879.330		340.30	1.200			

O. Σ. 249. *A* and *B*.

$\alpha = 12^h\ 18^m.1 \qquad \delta = 54^\circ\ 49'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.393	14.5	312.2	0.43	2	888	
9.439	13.3	309.4	0.44	3	888	
1879.416		311.80	0.435			

$\frac{A+B}{2}$ and *C*. (7 and 11).

1879.393	14.7	148.6	13.35	2	383	
9.439	13.5	149.7	13.18	3	383	*C* is 13th mag.
1879.416		149.15	13.265			
	Δp	− 0.01	+ 0.005			
		149.14	13.270			

Lalande 23271.

$\alpha = 12^h\ 20^m.5 \qquad \delta = 0^\circ\ 30'$ (8 and 11).

1876.419	12.6	236.8	0.99	2	606	
6.433	. .	232.0	0.78	2	606	
6.439	13.2	232.2	0.77	3	606	
1876.430		233.67	0.847			This star was discovered by A. G. CLARK.

Σ. 1647.

$\alpha = 12^h\ 24^m.5 \qquad \delta = 10^\circ\ 23'$ (7 and 8).

1876.362	. .	214.1	1.33	2	383	Mags. 9 and 9½.
6.398	. .	215.8	1.19	3	606	
6.406	. .	220.3	1.28	3	383 p 606 s	
9.319	11.6	219.8	1.26	3	383	
9.333	11.3	219.5	1.22	2	383	
9.387	13.8	219.3	1.16	2	383	Images blurred.
1876.389		216.73	1.267			
1879.338		219.58	1.224			

Σ. 1658.

$a = 12^{\rm h}\ 29^{\rm m}.0 \quad \delta = 8^\circ\ 7'$ (9 and 10).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.333	11.6	352.5	2.30	2	383	
9.387	13.5	352.6	2.53	2	383	
9.396	13.4	354.0	2.26	3	383	
1879.372		353.03	2.363			

γ Virginis.

$a = 12^{\rm h}\ 35^{\rm m}.6 \quad \delta = -0^\circ\ 47'$ (3 and 3).

1876.411	12.2	159.8	5.17	3	383	
6.417	12.7	159.9	5.24	2	383	Images blurred.
6.419	12.3	160.8	5.08	2	383	
6.422	12.3	160.3	5.12	2	383	
9.319	11.8	158.3	5.26	3	383	Clouds.
9.406	12.7	158.3	5.24	3	383	
9.409	12.3	158.4	5.09	3	383	
1876.417		160.24	5.140			
1879.378		158.33	5.197			

h 521.

$a = 12^{\rm h}\ 39^{\rm m}.2 \quad \delta = 28^\circ\ 3'$ (7 and 14).

1875.363	. .	2.9	32.78	.	392	

Σ. 1687. *A* and *B*.

$a = 12^{\rm h}\ 47^{\rm m}.4 \quad \delta = 21^\circ\ 53'$ (6 and 8).

1879.406	13.8	60.9	1.50	2	606	Images blurred.
9.409	12.8	66.2	1.41	3	606	
9.415	13.3	63.5	1.32	3	606	
9.417	13.0	60.2	1.31	2	383	
1879.413		62.96	1.369			

A and *C*. (6 and 8).

1879.406	14.0	125.3	28.84	2	383	
9.409	12.9	125.1	28.74	3	606	
9.417	13.2	125.0	28.78	3	383	
1879.411		125.13	28.787			
	$\Delta\rho =$	0.00	+ 0.008			
		125.13	28.795			

46 Virginis.

$a = 12^h\ 54^m.4$ $\delta = -2°\ 43'$ (6 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.403	13.8	159.4	1.16	3	606	6th and 11th mag.
6.406	. .	157.7	1.56	3	383	s difficult; ½ wt.
6.417	13.0	159.8	1.26	3	383	
9.406	13.0	156.0	1.27	2	606	
9.409	12.5	152.6	1.35	3	606	
9.415	12.7	154.7	1.23	3	606	
1876.409		159.22	1.280			
1879.410		154.43	1.283			This star was discovered by A. G. CLARK. It is doubtful if the change in the angle is real.

42 Comæ Ber. = Σ. 1728.

$a = 13^h\ 4^m.2$ $\delta = 18°\ 10'$ (6 and 6).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.381	. .	190.2	0.38	3	888	
6.403	14.2	194.3	0.42	3	888	
6.406	14.7	193.9	0.40	3	888	
6.417	13.3	195.2	0.42	3	888	
8.350	12.4	188.6	0.56	3	888	
8.380	11.6	190.2	0.47	2	888	
8.407	12.2	190.1	0.48	2	888	Very unsteady.
8.410	12.1	189.6	0.52	3	888	
9.409	13.2	192.9	0.52	3	888	
9.415	13.0	195.0	0.51	3	888	
9.417	13.4	193.9	0.49	3	888	
9.426	12.5	191.1	0.51	2	888	
1876.402		193.40	0.405			
1878.387		189.62	0.507			
1879.417		193.22	0.507			

ζ Ursæ Majoris.

$a = 13^h\ 19^m.1$ $\delta = 55°\ 33'$ (3 and 4).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.397	15.1	148.9	14.59	2	383	
7.408	12.3	147.6	14.66	2	383	Images blazing.
7.411	15.1	148.4	14.74	2	383	
7.416	15.1	148.1	14.67	2	383	
7.421	14.3	148.5	14.48	3	383	
7.427	15.3	148.8	14.47	3	383	
1877.413		148.38	14.602			
	$\Delta\rho =$	0.00	+ 0.005			
		148.38	14.607			This star was photographed at Cambridge in 1857. See *Astronomische Nachrichten*, volumes 47, 48, and 49.

O. Σ. 266.

$\alpha = 13^h\ 22^m.5$ $\delta = 16°\ 22'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.396	13.8	337.8	1.43	2	383	
9.409	13.5	337.6	1.70	3	606	
9.417	13.7	338.1	1.45	3	383	
1879.407		337.83	1.527			

Σ. 1757.

$\alpha = 13^h\ 28^m.2$ $\delta = 0°\ 18'$ (8 and 9).

1879.396	14.2	70.7	2.37	2	383	
9.406	14.4	67.1	2.30	2	383	
1879.401		68.90	2.335			

Σ. 1768.

$\alpha = 13^h\ 32^m.2$ $\delta = 36°\ 55'$ (6 and 7).

1875.365	. .	. .	. .	.	392	Star single; images bad.
1876.419	. .	. .	. .	.	606 888	Image much blurred, and not certain that star is divided.
1879.415	13.5	(163.4)	(0.20) est.	2	888	Star seems elongated.
9.478	14.3	159.2	0.53	3	888	Well seen.
9.480	14.2	153.0	0.49	3	888	
9.500	14.7	159.9	0.48	2	888	Images blurred.
9.502	14.7	162.8	0.59	2	888	Images indistinct.
9.505	14.8	155.2	0.44	2	888	Images indistinct.
1879.489		157.47	0.507			

B. A. C. 4549.

$\alpha = 13^h\ 33^m.6$ $\delta = 11°\ 21'$ (6 and 6).

1878.410	13.8	62.8	0.33	2	888	Elongated only.
8.467	14.1	52.6	0.24	2	888	Difficult.
9.478	14.7	244.2	0.18	3	1282	
9.480	14.5	242.4	0.23	3	1282	
1878.959		60.50	0.245			

Σ. 1777.

$\alpha\ 13^h\ 37^m.0$ $\delta = 4°\ 9'$ (6 and 8).

1879.406	14.7	228.7	3.43	2	383	
9.409	13.7	231.5	3.47	3	606	
1879.408		230.10	3.450			

86 Virginis. *A* and *B*.

$\alpha = 13^h\ 39^m.5$ $\delta = 11°\ 49'$ (6 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.480	14.8	291.9	1.60	3	383	
9.497	14.9	291.6	1.67	2	383	
9.500	15.1	295.1	1.46	2	606	
9.502	15.0	294.9	1.63	3	606	
9.530	15.5	294.2	1.70	3	383	
1879.502		293.54	1.612			

86 Virginis. *C* and *D*. (12 and 13).

1879.497	15.3	275.1	1.66	2	606	Images blurred.
9.502	15.2	277.1	1.94	2	606	Faint in moonlight.
1879.500		276.10	1.800			This star was discovered by S. W. BURNHAM. Both these observations were made in strong moonlight. Under these conditions the magnitudes were estimated 12 and 13.

Σ. **1781.**

$\alpha = 13^h\ 40^m.2$ $\delta = 5°\ 43'$ (7 and 8).

1879.406	14.9	263.7	1.14	2	606	
9.409	13.9	262.5	1.12	3	606	
1879.408		263.10	1.130			

O. Σ. **270.**

$\alpha = 13^h\ 41^m.6$ $\delta = 18°\ 4'$ (5 and 12).

1875.357	12.8	350.9	9.43	2	392	5th and 14th mags.

Σ. **1785.**

$\alpha = 13^h\ 43^m.6$ $\delta = 27°\ 35'$ (7 and 8).

1879.409	14.2	212.9	2.06	3	606	
9.417	14.0	215.7	1.99	3	383	
9.426	12.8	215.0	2.06	3	606	
1879.417		214.53	2.037			

Σ. **1788.**

$\alpha = 13^h\ 48^m.6$ δ $7°\ 28'$ (6 and 7).

1879.409	14.5	[illegible].0	2.68	3	383	
9.426	13.0	[illegible].0	2.59	2	606	
1879.418		[illegible]4.00	2.635			

Σ. 1813.

$\alpha = 14^h\ 7^m.4$ $\delta = 5^\circ\ 58'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.398	. .	193.5	4.99	3	383	
6.403	. .	192.8	4.88	3	606	
1876.400		193.15	4.935			

O. Σ. 278.

$\alpha = 14^h\ 7^m.5$ $\delta = 44^\circ\ 45'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.439	13.9	110.8	0.35	3	888	
9.453	13.5	110.5	0.34	3	888	
1879.446		110.65	0.345			

Σ. 1820.

$\alpha = 14^h\ 8^m.8$ $\delta = 55^\circ\ 53'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.439	14.2	67.6	2.23	3	383	
9.450	15.4	243.7	2.21	2	383	
9.453	13.8	68.5	2.18	4	383	
1879.447		66.60	2.207			

Σ. 1819.

$\alpha = 14^h\ 9^m.3$ $\delta = 3^\circ\ 42'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.403	15.0	201.7	1.25	3	606	
6.406	14.4	199.3	1.37	3	383	
6.417	13.6	199.4	1.15	3	383	
1876.409		200.13	1.257			

Σ. 1825.

$\alpha = 14^h\ 11^m.0$ $\delta = 20^\circ\ 41'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.409	14.7	175.2	4.13	3	383	
9.426	13.2	177.2	4.03	3	606	
1879.418		176.20	4.080			

Σ. 1830.

$\alpha = 14^h\ 11^m.9$ $\delta = 57^\circ\ 14'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.450	15.9	285.0	5.94	2	383	
9.453	14.0	285.8	5.93	4	383	
9.461	13.9	284.1	5.93	3	383	
1879.455		284.97	5.933			

Σ. 1831.

$\alpha = 14^h\ 12^m.4$ $\delta = 57^\circ\ 16'$ (6 and 9).

1879.450	15.7	140.4	6.15	2	383	
9.453	14.1	140.2	6.02	4	383	
9.461	13.8	138.7	5.98	3	383	
1879.455		139.77	6.050			

Σ. 1834.

$\alpha = 14^h\ 15^m.9$ $\delta = 49^\circ\ 4'$ (7 and 7).

1879.464	14.2	114.0	0.49	3	888	
9.467	14.1	114.5	0.41	3	888	
9.469	14.0	116.0	0.47	3	888	
1879.467		114.83	0.457			

Σ. 1837.

$\alpha = 14^h\ 18^m.2$ $\delta = -11^\circ\ 7'$ (7 and 9).

1879.409	15.0	306.4	1.25	3	606	
9.426	13.5	309.9	1.45	2	606	
9.480	15.5	307.1	1.44	2	383	
1879.438		307.80	1.380			

Σ. 1863.

$\alpha = 14^h\ 34^m.0$ $\delta = 52^\circ\ 9'$ (7 and 7).

1879.439	14.4	94.3	0.60	3	888	
9.453	14.4	91.5	0.57	3	888	Hazy.
9.461	14.3	91.7	0.47	3	383	
1879.451		92.50	0.547			

Σ. 1864.

$\alpha = 14^h\ 35^m.1 \quad \delta = 16^\circ\ 56'$ (5 and 6).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.426	13.8	100.6	6.09	2	606	
9.478	14.0	100.8	6.08	3	383	
9.480	15.3	100.7	5.93	3	383	
1879.461		100.70	6.033			

ζ Bootis = Σ. 1865.

$\alpha = 14^h\ 35^m.4 \quad \delta = 14^\circ\ 15'$ (4 and 5).

1876.419	13.4	303.1	0.73	3	888	
6.439	13.7	305.2	0.75	3	606	
6.441	13.6	303.4	0.70	3	606	
8.410	12.8	118.2	0.56	3	888	
8.424	13.0	120.7	0.55	2	888	
9.426	14.1	300.6	0.51	2	888	
9.478	15.3	117.1	0.66	3	888	
9.480	15.8	115.8	0.67	2	888	
1876.433		303.90	0.727			
1879.044		298.48	0.590			

Σ. 1867.

$\alpha = 14^h\ 35^m.6 \quad \delta = 31^\circ\ 49'$ (7 and 8).

1876.455	14.4	16.8	1.39	3	383	
6.471	14.0	13.5	1.15	2	606	
6.480	14.5	17.2	1.20	4	383	
1876.469		15.83	1.247			

ε Bootis = Σ. 1877.

$\alpha = 14^h\ 39^m.7 \quad \delta = 27^\circ\ 35'$ (3 and 6).

1876.419	13.7	328.6	2.94	3	606	
6.439	14.0	330.4	2.90	3	383	
6.441	14.0	327.2	3.09	2	383	
8.407	12.6	326.9	2.87	2	383	Unsteady images.
8.410	12.4	326.2	2.87	3	383	
9.426	14.4	328.7	2.98	3	383	
9.478	15.5	329.3	3.11	2	383	
9.480	16.1	327.5	2.77	2	606	
1878.063		328.10	2.941			

Σ. 1883.

$\alpha = 14^h\ 42^m.8$ $\delta = 6^\circ\ 25'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.426	14.7	75.9	0.55	3	888	
9.478	15.9	258.0	0.88	2	888	
9.480	16.3	257.6	0.76	2	606	
1879.461		257.17	0.730			

h 5489.

$\alpha = 14^h\ 45^m$ $\delta = 29^\circ\ 7'$ (6 and 16).

1875.404	. .	207.6	55.78	2	392	Comp. excessively faint.
8.380	12.4	206.1	56.72	3	383	
1876.892		206.85	56.25			Herschel's companion was not visible.

ξ Bootis = Σ. 1888.

$\alpha = 14^h\ 45^m.8$ $\delta = 19^\circ\ 36'$ (5 and 7).

1876.419	14.0	284.9	4.59	3	606	
6.439	14.4	280.6	4.67	3	383	
6.441	14.3	284.6	4.65	2	383	
8.410	13.1	276.4	4.29	3	383	
8.424	13.4	278.5	4.34	2	383	
9.502	15.7	274.3	4.23	3	383	
9.505	15.1	276.7	4.23	3	383	
9.519	15.1	275.6	4.12	2	383	
9.524	16.0	274.9	4.12	2	383	Cloudy.
9.530	15.2	276.9	4.21	3	383	
1876.433		283.37	4.637			
1878.417		277.45	4.315			
1879.516		275.68	4.182			

O. Σ. 288.

$\alpha = 14^h\ 47^m.8$ $\delta = 16^\circ\ 11'$ (6 and 7).

1879.497	15.9	197.6	1.39	2	606	
9.500	16.1	198.4	1.23	2	606	
9.502	15.9	197.4	1.29	3	383	
1879.500		197.80	1.303			

P. 212.

$\alpha = 14^h\ 50^m.5 \quad \delta = -20°\ 52'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.497	15.7	289.0	15.44	2	383	
9.500	15.4	289.7	15.34	3	383	
9.502	15.4	289.1	15.40	3	383	
1879.500		289.27	15.393			
	$\Delta p =$	− 0.01	+ 0.005			
		289.26	15.398			

2 Serpentis.

$\alpha = 14^h\ 55^m.7 \quad \delta = 0°\ 21'$ (6 and 8).

1875, May 28. With power 392 the star appears oblong in $p = 15°$, but with 606 there is no trace of duplicity. A companion of 13th–14th mag. in $p = 220°$, and $s = 25''$, by estimation.

44 Bootis = Σ. 1909.

$\alpha = 14^h\ 59^m.9 \quad \delta = 48°\ 7'$ (5 and 6).

1876.471	14.3	240.4	5.03	3	383	
6.480	14.7	240.6	5.02	3	383	
1876.476		240.50	5.025			

Σ. 1910.

$\alpha = 15^h\ 1^m.8 \quad \delta = 9°\ 41'$ (7 and 7).

1879.497	16.3	211.4	4.30	2	383	
9.500	16.4	212.1	4.24	2	383	
9.502	16.2	211.1	4.41	3	383	
1879.500		211.53	4.317			

Lalande 27579.

$\alpha = 15^h\ 2^m.9 \quad \delta = 2°\ 9'$ (8 and 12).

1876.488	. .	38.0	3.92	3	383	
6.499	. .	36.6	. .	3	383	Clouds.
6.543	. .	35.6	4.01	2	383	
1876.510		36.73	3.965			This star was discovered by S. W. BURNHAM.

B. A. C. 5020.

$\alpha = 15^h\ 8^m.5$ $\delta = -27°\ 9'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.488	. .	161.1	1.47	3	383	
6.545	15.7	165.2	1.16	2	383	
1876.516		163.15	1.315			This star was discovered by S. W. Burnham.

Σ. 3091.

$\alpha = 15^h\ 9^m.7$ $\delta = -4°\ 26'$ (8 and 14).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1875.406	. .	249.4	12.73	2	606	The principal star appeared single. There is another faint companion of 12th mag. in $p =$ 270°, and $s =$ 30″, by estimation.

Oeltzen Arg. S. 14417.

$\alpha = 15^h\ 10^m.3$ $\delta = -15°\ 9'$ (9.5 and 12).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.559	16.4	303.3	10.36	3	383	This star was discovered by S. W. Burnham.

O. Σ. 295

$\alpha = 15^h\ 10^m.4$ $\delta = 37°\ 16'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.439	14.9	126.1	1.01	3	888	
9.453	14.7	127.9	0.93	3	888	
9.461	14.7	130.6	0.97	2	888	
1879.451		128.20	0.970			

Σ. 1925.

$\alpha = 15^h\ 10^m.5$ $\delta = -7°\ 50'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.502	16.4	10.9	4.86	3	383	
9.505	15.8	11.8	4.94	3	383	
9.519	15.4	11.6	4.88	2	383	
1879.509		11.43	4.893			

Σ. 1930.

$\alpha = 15^h\ 13^m.2$ $\delta = 2°\ 14'$ (5 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.502	16.6	39.7	10.76	3	383	
9.505	16.2	40.0	10.72	3	383	
9.519	15.6	40.2	10.66	2	383	
1879.509		39.97	10.713			

Σ. 1932.

$\alpha = 15^h\ 13^m.2$ $\delta = 27\ 18'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.505	15.4	125.2	1.09	3	606	
9.530	16.1	121.3	1.18	3	606	
9.532	15.3	120.2	1.04	2	606	
1879.522		122.22	1.103			

Σ. 1934.

$\alpha = 15^h\ 13^m.2$ $\delta = 44°\ 14'$ (8 and 9).

1879.464	15.1	214.3	6.65	3	383	
9.467	14.4	214.2	6.54	3	888	
1879.466		214.25	6.595			

6 Serpentis.

$\alpha = 15^h\ 14^m.9$ $\delta = 1°\ 9'$ (4.5 and 10).

1875.404	. .	14.8	3.11	3	392	

η Coronæ Borealis = Σ. 1937.

$\alpha = 15^h\ 18^m.3$ $\delta = 30°\ 43'$ (5 and 6).

1876.419	14.3	250.4	0.76	3	888	
6.441	14.7	250.3	0.86	2	606	
6.444	14.3	249.7	0.71	2	606	
6.455	14.8	251.7	0.75	3	606	
9.541	15.9	97.8	0.50	2	888	
9.543	15.7	99.6	0.48	3	888	
9.546	15.5	97.6	0.48	3	888	
9.549	15.8	99.8	0.48	3	888	
1876.440		70.52	0.770			
1879.545		98.70	0.485			

μ^2 Bootis = Σ. 1938.

$\alpha = 15^h\ 20^m.0$ $\delta = 37°\ 46'$ (7 and 8).

1876.419	14.6	146.5	0.78	3	888	
6.441	15.0	148.9	0.70	2	606	
6.444	14.5	143.0	0.72	3	606	
6.452	14.4	143.1	0.73	2	606	
9.541	16.2	132.8	0.73	3	888	

μ^2 **Bootis = Σ. 1938**—Continued.

$\alpha = 15^h\ 20^m.0$ $\delta = 37°\ 46'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.543	15.9	134.6	0.74	2	888	
9.546	15.7	134.6	0.72	3	888	
9.549	16.1	131.3	0.73	3	888	Faint.
1876.439		145.38	0.732			
1879.545		133.32	0.730			

μ **Bootis** and mean of μ^2 **Bootis.**

$\alpha = 15^h\ 20^m.0$ $\delta = 37°\ 46'$ (4 and 7).

1879.543	16.2	171.47	108.27	3	383	
9.546	15.9	171.56	108.40	4	383	
1879.544		171.515	108.335			
	$\Delta\rho =$	+ 0.002	+ 0.030			
		171.517	108.365			

Σ. 1944.

$\alpha = 15^h\ 21^m.8$ $\delta = 6°\ 31'$. (7 and 8).

1879.505	16.4	334.3	1.22	3	606	
9.530	16.4	333.6	1.20	3	606	
9.532	15.5	333.7	1.34	3	606	
1879.522		333.87	1.253			

O. Σ.

$\alpha = 15^h\ 22^m.3$ $\delta = 44°\ 26'$ (8 and 9).

1879.461	15.0	313.1	1.73	2	606	
9.464	14.5	313.1	1.65	3	383	
9.467	14.6	315.3	1.67	3	888	
1879.464		313.83	1.683			

δ **Serpentis = Σ. 1954.**

$\alpha = 15^h\ 29^m.1$ $\delta = 10°\ 57'$ (3 and 4).

1876.417	15.0	189.7	3.46	3	383	
6.419	15.0	190.0	3.40	2	606	
6.439	14.7	190.3	3.61	2	383	Blurred images.

δ Serpentis = Σ. 1954—Continued.

$\alpha = 15\ 29^m.1 \quad \delta = 10^\circ\ 57'$ (3 and 4).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.530	16.6	192.5	3.39	3	606	
9.532	15.7	190.0	3.42	2	606	
9.535	15.3	190.0	3.39	2	606	
1876.422		189.94	3.466			
1879.532		190.83	3.400			

Σ. 1957.

$\alpha = 15^h\ 30^m.2 \quad \delta = 13^\circ\ 18'$ (8 and 10).

1879.530	16.9	162.4	1.35	3	606	
9.532	15.8	159.5	1.10	3	606	
9.535	15.7	158.9	1.14	3	606	
1879.532		160.27	1.197			

O. Σ. 298.

$\alpha = 15^h\ 31^m.7 \quad \delta = 40^\circ\ 13'$ (7 and 8).

1879.439	15.3	331.9	0.25	3	888	
9.461	15.4	334.4	0.27	2	1282	
9.464	14.8	340.3	0.29	2	1282	
9.467	15.1	333.5	0.23	3	1282	
1879.458		335.02	0.260			

ζ Coronæ Borealis = Σ. 1965.

$\alpha = 15^h\ 34^m.9 \quad \delta = 37^\circ\ 2'$ (4 and 5).

1876.444	14.7	302.5	6.33	3	383	
6.452	15.0	302.5	6.24	2	383	
6.455	15.2	299.9	6.30	3	383	Observer, H. S. PRITCHETT.
9.467	14.8	301.8	6.24	3	383	
9.469	14.6	303.3	6.30	3	383	
9.472	14.6	301.3	6.23	3	383	
1878.261		302.28	6.268			

γ Coronæ Borealis = Σ. 1967.

$\alpha = 15^h\ 37^m.7 \quad \delta = 26^\circ\ 40'$ (4 and 7).

1875.404		Single.				
6.455		Single.				
9.554		Single.				
9.584		Single.				

ε Cor. Bor.

$\alpha = 15^h\ 52^m.6$ $\delta = 27°\ 14'$ (4 and 12).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.406	14.9	347.6	2.05	3	383	4th and 12th mags.
6.417	15.3	353.4	2.14	1.5	606	Very difficult.
6.419	15.3	350.4	2.17	3	606	Comp. 12th mag.
7.378	16.0	355.1	2.34	2	606	
9.546	16.2	355.8	. .	3	383	Comp. 13th mag.
9.554	15.7	353.8	. .	2	606	
1877.620		352.68	2.175			This star was discovered by Mr. A. G. Clark, May 3, 1876.

O. Σ. 303.

$\alpha = 15^h\ 55^m.3$ $\delta = 13°\ 37'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.530	17.1	130.6	0.69	3	888	
9.532	16.0	137.0	0.64	2	888	
9.535	15.5	133.2	0.76	3	606	
1879.532		133.60	0.697			

ξ Scorpii. *A* and *B*.

$\alpha = 15^h\ 57^m.8$ $\delta = -11°\ 3'$ (5 and 5).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.471	14.7	2.5	1.23	3	383	
6.545	16.0	5.5	1.14	3	383	
6.548	16.1	3.6	1.05	2	383	
9.530	17.4	11.0	1.22	2	606	
9.535	16.0	8.9	1.06	2	606	
9.554	16.0	9.6	1.04	2	606	
1878.031		6.85	1.123			

$\frac{A+B}{2}$ and *C*. (5 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.472	15.0	65.7	7.27	3	383	Clouds.
6.548	16.3	68.9	7.33	2	383	
1876.510		67.30	7.300			

A and *C*.

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.530	17.5	63.1	7.81	2	606	
9.535	16.1	64.8	7.72	2	606	
9.554	16.1	62.8	7.73	2	606	
1879.540		63.57	7.753			

β Scorpii.

$\alpha = 15^h\ 58^m.5$ $\delta = -19°\ 29'$ (2 and 10).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.587	16.6	97.3	0.85	3	383	Elongated only.

ν Scorpii. *A* and *B*.

$\alpha = 16^h\ 5^m.0$ $\delta = -19°\ 9'$ (4 and 7).

1879.587	16.2	5.3	0.74	3	606	

C and *D*.

1875.406	. .	(42.2)	(2.61)	2	392	Rejected.
9.535	16.4	47.1	1.78	2	606	
9.554	16.4	45.4	2.20	2	383	
9.557	16.8	46.6	2.18	2	383	Clouds.
9.584	16.4	46.8	2.15	3	606	
1879.557		46.48	2.078			

49 Serpentis = Σ. 2021.

$\alpha = 16^h\ 7^m.7$ $\delta = 13°\ 51'$ (7 and 7).

1876.452	15.3	329.0	3.80	2	383	
6.455	15.8	328.9	3.79	2	383	
6.458	15.8	328.4	3.84	3	383	
1876.455		328.77	3.810			

Σ. 2022.

$\alpha = 16^h\ 7^m.9$ $\delta = 26°\ 58'$ (6 and 10).

1879.532	16.2	135.1	2.75	3	606	
9.535	16.7	138.3	2.69	2	606	
1879.533		136.70	2.720			

σ Cor. Bor. = Σ. 2032. *A* and *B*.

$\alpha = 16^h\ 10^m.2$ $\delta = 34°\ 10'$ (5 and 6).

1876.452	15.8	201.1	3.45	2	383	
6.455	16.1	200.0	3.58	3	383	
6.458	15.5	199.0	3.46	3	383	
9.439	15.5	203.6	3.72	3	383	

σ Cor. Bor, = Σ. 2032. *A* and *B*—Continued.

$\alpha = 16^h\ 10^m.2$ $\delta = 34^\circ\ 10'$ (5 and 6).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1879.453	15.0	201.3	3.56	3	383	
9.461	15.7	202.3	3.71	2	383	
9.464	15.3	202.8	3.65	2	383	
1876.455		200.03	3.497			
1879.454		202.50	3.660			

A and *C*.

1876.455	16.2	222.7	15.92	2	383	16th mag.
1879.439	15.7	224.4	15.86	3	383	*C* is 16th mag.
1877.947		223.55	15.890			
	Δp =	− 0.01	+ 0.005			
		223.54	15.895			

Antares.

$\alpha = 16^h\ 22^m.1$ $\delta = -26^\circ\ 10'$ (1 and 8).

1877.542	16.4	269.5	3.16	2	383	
7.564	16.3	273.2	3.40	2	383	
7.567	16.0	272.6	3.16	2	383	Images blazing.
7.569	16.3	270.8	3.27	2	383	
1877.560		271.52	3.248			

Σ. 2052.

$\alpha = 16^h\ 23^m.6$ $\delta = 18^\circ\ 40'$ (8 and 8).

1879.535	17.0	101.9	2.68	3	606	
9.554	16.7	100.6	2.76	3	606	
9.584	16.9	102.2	2.66	3	383	
1879.558		101.57	2.700			

λ Ophiuchi = Σ. 2055.

$\alpha = 16^h\ 24^m.9$ $\delta = 2^\circ\ 15'$ (4 and 6).

1876.452	16.1	36.1	1.45	2	383	
6.455	16.5	33.7	1.49	1.5	383	
6.458	16.4	33.7	1.52	3	383	
6.471	15.3	31.7	. .	2	383	Cloudy.
6.545	16.3	32.1	1.64	3	383	

λ Ophiuchi = Σ. 2055—Continued.

$\alpha = 16^h\ 24^m.9$ $\delta = 2°.15'$ (4 and 6).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.535	17.3	35.8	1.34	3	606	
9.554	16.9	34.5	1.61	2	606	Images blurred.
9.584	17.2	34.4	1.50	3	606	
9.587	16.8	35.2	1.40	3	606	
1876.476		33.46	1.525			
1879.567		35.04	1.441			

ζ Herculis = Σ. 2084.

$\alpha = 16^h\ 36^m.8$ $\delta = 31°\ 49'$ (3 and 6).

1876.458	16.2	144.0	1.29	2	606	Much blurred.
6.559	16.1	142.6	1.33	2	606	
7.583	16.6	133.4	1.19	2	606	
7.591	16.3	134.6	1.29	2	383	
9.453	15.3	122.8	1.48	2	888	
9.464	15.6	120.9	1.54	2	606	
9.467	15.5	119.4	1.44	3	606	
9.469	15.4	119.9	1.53	3	606	
1876.525		143.07	1.317			
1877.587		134.00	1.240			
1879.463		120.75	1.498			

Σ. 2106.

$\alpha = 16^h\ 45^m.4$ $\delta = 9°\ 36'$ (7 and 8).

1879.584	17.9	312.9	0.42	3	888	
9.587	17.0	320.7	0.43	3	888	
9.595	17.4	315.5	0.52	2	888	
1879.589		316.37	0.547			

Σ. 2107.

$\alpha = 16^h\ 47^m.1$ $\delta = 28°\ 52'$ (7 and 9).

1879.584	18.3	224.4	0.58	2	888	
9.587	17.3	216.6	0.52	3	888	
9.609	16.8	218.6	0.54	2	888	
1879.593		219.87	0.547			

Σ. 2114.

$\alpha = 16^h\ 56^m.2$ $\delta = 8°\ 37'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.587	17.7	156.0	1.31	3	606	
9.595	17.8	155.8	1.27	2	888	
1879.591		155.90	1.290			

Σ. 2120.

$\alpha = 17^h\ 0^m.0$ $\delta = 28°\ 16'$ (7 and 9).

1876.458	16.7	255.9	4.65	4	383	
6.545	16.6	257.2	4.55	3	383	
6.548	16.5	256.7	4.58	3	383	
9.612	17.0	253.3	4.83	3	606	
9.615	17.0	254.4	4.93	3	606	
1876.517		256.60	4.593			
1879.614		253.85	4.880			

μ Draconis = Σ. 2130.

$\alpha = 17^h\ 2^m.8$ $\delta = 54°\ 38'$ (5 and 5).

1877.411	15.3	169.6	2.68	2	383	
7.416	15.4	170.9	2.71	2	383	
7.422	14.7	169.1	2.64	3	383	
7.427	15.6	169.4	2.68	2	383	
7.446	15.3	169.2	2.51	3	383	
1877.424		169.64	2.644			

36 Ophiuchi.

$\alpha = 17^h\ 8^m.0$ $\delta = -26°\ 25'$ (5 and 7).

1876.559	16.8	202.2	4.47	2	383	
6.622	17.5	204.4	4.59	2	383	
6.641	17.2	202.9	4.55	2	383	
7.583	17.1	203.9	4.52	2	383	
7.591	16.6	202.1	4.44	2	383	
1876.999		203.10	4.514			

Σ. 3127.

$\alpha = 17^h\ 10^m.0$ $\delta = 24°\ 58'$ (3 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.554	17.3	183.1	17.81	2	383	
9.587	17.5	184.3	17.71	3	383	
1879.570		183.70	17.760			
	$\Delta\rho =$	0.00	+ 0.005			
		183.70	17.765			

Σ. 2153.

$\alpha = 17^h\ 14^m.8$ $\delta = 49°\ 26'$ (8 and 9).

1879.453	15.8	271.0	1.88	2	888	
9.461	16.1	273.0	1.93	2	606	
9.464	16.3	272.0	1.96	2	606	
1879.459		272.00	1.923			

Σ. 2160.

$\alpha = 17^h\ 19^m.1$ $\delta = 15°\ 43'$ (6 and 10).

1879.554	17.6	68.0	3.88	3	383	
9.587	18.0	67.0	3.87	3	606	
1879.570		67.50	3.875			

Σ. 2161.

$\alpha = 17^h\ 19^m.5$ $\delta = 37°\ 16'$ (4 and 6).

1879.464	16.6	310.1	3.97	2	383	
9.467	16.1	308.9	3.93	2	383	
9.469	15.7	311.0	3.86	2	383	
1879.467		310.00	3.920			

Σ. 2163.

$\alpha = 17^h\ 19^m.6$ $\delta = 42°\ 16'$ (10 and 10).

1879.467	16.5	96.5	1.47	3	383	
9.469	16.0	94.6	1.48	3	383	
1879.468		95.55	1.475			

Σ. 2173.

$\alpha = 17^h\ 24^m.2$ $\delta = -0°\ 58'$ (6 and 6).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.458	17.0	148.3	0.66	3	606	
6.545	16.8	152.6	0.90	2	383	
6.548	16.8	146.9	0.76	2	383	
1876.517		149.27	0.773			

Σ. 2199.

$\alpha = 17^h\ 36^m.4$ $\delta = 55°\ 49'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.467	16.7	100.6	1.65	3	383	
9.469	14.4	96.6	1.59	2	888	
9.472	14.1	98.4	1.76	3	383	
1879.469		98.53	1.667			

Σ. 2203.

$\alpha = 17^h\ 37^m.6$ $\delta = 41°\ 43'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.467	17.0	328.6	0.85	2	888	
9.469	16.3	322.9	0.75	3	888	
9.472	14.4	323.0	0.68	2	888	
1879.469		324.83	0.760			

Σ. 2214. *A* and *B*.

$\alpha = 17^h\ 39^m.8$ $\delta = 43°\ 47'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.467	17.4	212.6	19.58	3	383	
9.469	16.6	213.0	19.51	3	383	
1879.468		212.80	19.545			
	$\Delta\rho =$	0.00	+ 0.006			
		212.80	19.551			

B and *C*. (9 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1879.467	17.6	146.1	1.36	3	606	
9.469	16.7	143.6	1.35	3	383	
1879.468		144.85	1.355			

Σ. 2215.

$\alpha = 17^h\ 41^m.6$ $\delta = 17°\ 46'$ (6 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.595	18.4	295.9	0.70	2	888	Clouds.
9.609	17.2	301.6	0.77	2	888	
9.612	17.5	297.2	0.92	2	888	Hazy; images confused.
1879.604		298.44	0.772			

μ^1 Herculis.

$\alpha = 17^h\ 41^m.8$ $\delta = 27°\ 48'$ (10 and 11).

1875.675	18.8	218.4	1.27	3	606	
5.686	19.0	219.1	1.24	3	383	
5.688	. .	222.2	1.03	3	606	Best distance.
5.691	18.7	220.3	. .	2	383	
5.705	. .	223.1	. .	3	606	
6.548	17.1	225.6	0.77	2	383	
6.559	17.2	224.2	0.68	2	606	
6.622	17.9	223.2	0.72	3	606	
6.628	17.5	220.6	0.71	2	606	
7.583	17.4	233.5	0.84	3	606	
7.591	16.9	232.1	0.86	3	606	
8.503	16.0	233.8	0.88	2	606	
9.543	17.0	237.9	0.98	2	606	
9.546	16.8	238.5	0.93	3	606	
9.549	16.9	242.0	1.00	2	606	Faint.
1875.689		220.62	(1.180)			
1876.589		223.40	0.720			
1877.587		232.80	0.850			
1878.503		233.80	0.880			The distances observed in 1875 are uncertain. It is possible that quadruple distances were measured.
1879.546		239.47	0.970			

μ^2 Herculis. A and $\frac{B + C}{2}$ (4 and 10).

1875.683	18.8	244.1	31.13	2	606	

O. Σ. 338.

$\alpha = 17^h\ 46^m.5$ $\delta = 15°\ 21'$ (7 and 7).

1879.587	18.8	204.7	0.71	2	888	
9.595	18.0	19.0	0.68	2	888	
9.609	17.0	21.8	0.74	2	888	
1879.597		21.83	0.710			

A. C. 9.

$\alpha = 17^h\ 49^m.9$ $\delta = 29° 50'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.543	17.2	230.5	1.06	2	606	
9.546	17.0	232.2	1.07	3	606	
9.549	17.2	232.6	1.04	3	606	
1879.546		231.77	1.057			

τ Ophiuchi = Σ. 2262.

$\alpha = 17^h\ 56^m.5$ $\delta = -8° 11'$ (5 and 6).

1876.628	17.8	250.6	1.71	3	383	
6.641	17.5	250.5	1.71	2	383	
6.644	17.7	252.1	1.73	2	383	
7.534	17.8	250 4	1.51	2	383	Images blurred.
7.542	17.2	249.8	1.55	3	383	
7.564	16.6	249.4	1.60	2	383	
7.569	17.3	246.1	1.46	3	383	
1877.132		249.80	1.618			

Σ. 2267.

$\alpha = 17^h\ 57^m.8$ $\delta = 40° 11'$ (8 and 9).

1879.543	17.5	240.8	1.17	2	606	
9.546	17.3	240.7	1.24	3	606	
9.549	17.4	239.3	1.24	3	606	
1879.546		240.27	1.217			

70 Ophiuchi = Σ. 2272.

$\alpha = 17^h\ 59^m.4$ $\delta = 2° 33'$ (5 and 6).

1876.628	18.1	80.5	3.57	3	383	
6.641	17.9	81.0	3.64	2	383	
6.644	18.0	81.3	3.47	3	383	
7.534	17.2	76.0	3.50	2	383	
7.542	17.5	76.1	3.30	3	383	
7.564	16.9	75.9	3.28	2	383	
7.569	17.6	75.3	3.36	3	383	
9.554	17.9	70.0	3.05	2	383	
9.584	18.9	71.9	2.98	2	606	
9.587	18.2	72.0	2.87	3	606	
9.595	18.2	71.0	2.85	3	606	
9.609	17.5	71.7	2.90	2	606	
1876.638		80.93	3.560			
1877.552		75.82	3.360			
1879.588		71.32	2.930			

70 Ophiuchi (*a*).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.840	21.1	49.57	86.80	2	383	
8.842	21.0	49.50	87.24	2	383	
8.845	21.0	49.74	87.39	2	383	
1878.842		49.603	87.143			
	Δρ	− 0.012	+ 0.066			
		49.591	87.209			(*a*) is a small star of about the 13th mag.

70 Ophiuchi (*b*).

1878.840	21.1	198.17	71.70	2	383	
8.842	21.0	197.58	71.26	2	383	
8.845	21.0	197.82	71.03	2	383	
1878.842		197.857	71.330			
	Δρ =	− 0.012	+ 0.054			
		197.845	71.384			(*b*) is a small star of about the 13th mag.

72 Ophiuchi = *O.* Σ. 342.

$\alpha = 18^h\ 1^m.6$ $\delta = 9^\circ\ 33'$ (4 and 7).

1876.723	18.9	No close companion visible; images good through a slight haze.
6.737	18.9	No close companion visible; seeing fair in twilight. A distant comp. in $p = 168^\circ$, and $s = 51''.2$; mag. 11th, 12th.
9.636	19.3	This star is single; powers, 383 and 606; wt., 3.
9.680	18.1	This star is single; powers, 383 and 606; wt., 2.

Σ. 2281.

$\alpha = 18^h\ 3^m.6$ $\delta = 3^\circ\ 58'$ (6 and 7).

1879.584	19.1	242.1	0.96	2	888	Image confused.
9.587	19.0	246.8	0.99	2	888	
1879.586		245.23	0.980			

Σ. 2289.

$\alpha = 18^h\ 4^m.6$ $\delta = 16^\circ\ 27'$ (6 and 7).

1879.587	19.2	229.7	1.13	2	888	Faint; clouds.
9.595	18.6	228.5	1.13	2	888	Clouds.
9.683	17.9	234.4	1.18	3	606	
1879.622		230.87	1.147			

Σ. 2315.

$\alpha = 18^h\ 20^m.2$ $\delta = 27°\ 20'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.615	17.3	238.3	0.31	3	888	
9.636	17.8	241.0	0.30	3	888	
1879.626		239.65	0.305			

Σ. 2323.

$\alpha = 18^h\ 22^m.2$ $\delta = 58°\ 44'$ (5 and 8).

1879.543	17.7	2.1	3.66	2	606	Very unsteady.
9.546	17.7	359.9	3.62	2	606	
9.549	17.7	0.6	3.63	3	606	
1879.546		0.87	3.637			

O. Σ. 358.

$\alpha = 18^h\ 30^m.5$ $\delta = 16°\ 54'$ (6 and 7).

1879.612	17.9	20.9	1.75	3	606	
9.615	17.6	21.9	1.78	3	606	
9.636	18.1	19.9	1.82	3	606	
1879.621		20.90	1.783			

ε_1 Lyræ = Σ. 2382.

$\alpha = 18^h\ 40^m.4$ $\delta = 39°\ 33'$ (5 and 6).

1877.421	16.1	16.3	2.98	2	383	
7.427	16.7	16.7	3.24	2	383	
7.446	16.2	16.2	3.00	2	383	
7.452	15.7	15.1	3.08	2	383	
1877.436		16.07	3.075			

ε_2 Lyræ = Σ. 2383.

$\alpha = 18^h\ 40^m.4$ $\delta = 39°\ 29'$ (5 and 5).

1877.421	16.4	139.7	2.50	2	383	
7.427	16.8	136.9	2.42	2	383	
7.446	16.4	136.4	2.49	2	383	
7.452	15.9	137.2	2.40	2	383	
1877.436		137.55	2.452			

Σ. 2396.

$\alpha = 18^h\,42^m.9$ $\delta = 10^\circ\,40'$ (8 and 11).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.612	18.3	314.55	21.99	3	606	Hazy.
9.615	17.8	315.38	21.74	3	606	
1879.613		314.96	21.865			
	$\Delta\rho =$	0.00	+ 0.008			
		314.96	21.873			

Anonyma.

$\alpha = 18^h\,43^m.0$ $\delta = 10^\circ\,45'$ (10 and 10).

1877.531	17.2	210.0	0.94	2	383	
7.534	17.0	208.1	0.77	2	606	
1877.532		209.05	0.855			

Anonyma.

$\alpha = 18^h\,43^m.0$ $\delta = 11^\circ\,20'$ (9 and 10).

1876.680	18.8	224.4	0.96	2	383	9th and 11th mags.
7.536	17.3	231.0	1.07	2	383	9th and 10th mags.
7.542	17.7	229.7	1.09	3	383	
1877.286		228.37	1.040			This star was discovered by S. W. BURNHAM.

G. A. 5.

$\alpha = 18^h\,44^m.0$ $\delta = 10^\circ\,40'$ (10 and 11).

1876.680	18.4	94.2	2.32	3	606	This star was discovered by G. ANDERSON.

Σ. 2402.

$\alpha = 18^h\,44^m.1$ $\delta = 10^\circ\,32'$ (8 and 9).

1876.669	18.6	201.3	0.87	3	606	
6.680	19.2	204.6	0.91	2	606	
9.612	18.5	203.9	1.06	2	888	
9.615	18.1	204.3	1.00	3	606	
1878.144		203.52	0.960			

Σ. 2404.

$\alpha = 18^h\ 45^m.1$ $\delta = 10^\circ\ 50'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1877.421	16.6	181.7	3.65	3	383	
7.427	17.1	182.2	3.61	2	383	
7.531	16.9	180.7	3.42	2	383	
7.534	16.7	181.7	3.65	2	383	
1877.478		181.57	3.582			

Σ. 2438.

$\alpha = 18^h\ 55^m.5$ $\delta = 58^\circ\ 4'$ (7 and 8).

1879.546	18.3	This star not double; powers, 383 and 606; thin clouds.

Σ. 2434. *A* and *B*.

$\alpha = 18^h\ 56^m.6$ $\delta = -0^\circ\ 53'$ (7 and 8).

1879.615	19.0	131.9	23.89	3	606	
9.636	18.4	132.0	23.89	3	606	
1879.625		131.95	23.890			
	$\Delta\rho =$	− 0.01	+ 0.009			
		131.94	23.899			

B and *C*. (8 and 12).

1879.615	19.1	64.3	1.65	3	606	
9.636	18.6	67.6	1.73	2	606	
1879.625		65.95	1.690			

Σ. 2437.

$\alpha = 18^h\ 56^m.6$ $\delta = 19^\circ\ 0'$ (8 and 8).

1879.612	18.9	67.5	0.78	2	606	Hazy.
9.615	18.7	66.5	0.87	3	606	
1879.613		67.00	0.825			

Σ. 2441.

$\alpha = 18^h\ 57^m.7$ δ $31^\circ\ 16'$ (8 and 9).

1879.549	18.1	280.6	5.50	3	606	
9.609	17.9	283.0	5.48	2	606	
1879.579		281.80	5.490			

ζ Aquilæ.

$\alpha = 18\ 58^m.9 \quad \delta = 13^\circ\ 41'$ (3 and 15).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.714	19.4	61.2	5.61	3	383	
8.717	19.2	60.2	. .	2	383	
8.719	18.9	61.8	5.45	3	383	
9.636	19.0	61.9	(6.24)	3	383	
9.639	18.2	60.4	5.59	3	383	
1879.085		61.10	5.550			

Σ. 2454.

$\alpha = 19^h\ 1^m.5 \quad \delta = 30^\circ\ 15'$ (8 and 9).

1879.549	18.4	227.4	0.91	3	606	
9.639	18.0	233.3	0.70	3	606	
9.678	18.5	230.4	0.79	2	606	
1879.622		230.37	0.800			

Σ. 2455.

$\alpha = 19^h\ 1^m.8 \quad \delta = 21^\circ\ 59'$ (7 and 8).

1879.639	17.6	102.5	3.58	3	606	
9.678	18.8	98.6	3.48	2	606	
1879.658		100.55	3.530			

Σ. 2481.

$\alpha = 19^h\ 7^m.1 \quad \delta = 38^\circ\ 36'$ (8 and 8).

1879.688	18.6	223.1	4.11	2	606	Very unsteady.
9.691	18.7	224.6	4.19	2	606	
1879.690		223.85	4.150			

Σ. 2486.

$\alpha = 19^h\ 9^m.0 \quad \delta = 49^\circ\ 37'$ (6 and 7).

1879.691	19.0	220.8	9.80	2	606	
9.694	18.7	220.6	9.83	3	383	
1879.692		220.70	9.815			

O. Σ. 368.

$\alpha = 19^h\ 10^m.6$ $\delta = 15^\circ\ 57'$ (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.639	18.5	214.5	0.80	3	606	
9.678	19.0	212.3	0.78	2	606	
1879.658		213.40	0.790			

Σ. 2496.

$\alpha = 19^h\ 12^m.3$ $\delta = 49^\circ\ 52'$ (7 and 11).

1879.694	18.9	80.6	2.21	3	383	Comp. 13th mag.
9.708	19.0	76.1	2.51	3	606	
1879.701		78.35	2.360			This star, supposed to be new on September 10, is probably Σ. 2496.

Σ. 2509.

$\alpha = 19^h\ 15^m.6$ $\delta = 62^\circ\ 59'$ (7 and 8).

1879.699	19.1	342.3	0.91	3	606	
9.708	19.3	340.0	1.02	2	606	
9.710	18.7	343.7	0.90	2	606	
1879.706		342.00	0.943			

Σ. 2525.

$\alpha = 19^h\ 21^m.7$ $\delta = 27^\circ\ 8'$ (7 and 8).

1879.680	18.4	213.8	0.32	3	888	
9.683	18.2	214.3	0.34	3	888	
9.762	19.3	211.4	0.32	3	888	
1879.708		213.17	0.327			

Σ. 2544. *A* and *B*.

$\alpha = 19^h\ 31^m.3$ $\delta = 8^\circ\ 2'$ (8 and 10).

1879.678	19.5	212.5	0.93	2	606	
9.680	18.8	210.1	0.91	2	606	
1879.679		211.30	0.920			

A and *C*. (8 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.678	19.6	237.9	15.78	2	606	
9.680	19.0	238.2	15.90	2	606	
1879.679		238.05	15.840			
	$\Delta\rho =$	0.00	+ 0.006			
		238.05	15.846			

Σ. 2553.

$\alpha = 19^h\ 31^m.8$ $\delta = 61°\ 47'$ (8 and 9).

1879.713	19.0	93.9	0.87	2	888	
9.749	19.2	95.7	0.94	3	606	
1879.731		94.80	0.905			

Σ. 2556.

$\alpha = 19^h\ 34^m.4$ $\delta = 21°\ 58'$ (7 and 8).

1879.680	19.5	164.3	0.60	2	888	
9.683	18.5	159.2	0.48	2	888	
9.691	19.4	164.9	0.64	2	888	Images blurred.
1879.683		162.38	0.560			

O. Σ. 380.

α $19^h\ 36^m.9$ $\delta = 11°\ 33'$ (6 and 7).

1879.639	19.5	77.6	0.54	2	888	
9.680	19.8	78.1	0.59	2	888	
9.683	18.8	74.7	0.54	2	888	
1879.667		76.80	0.557			

Σ. 2576.

$\alpha = 19^h\ 40^m.9$ $\delta = 33°\ 20'$ (8 and 8).

1879.683	19.1	123.7	3.14	3	606	
9.688	19.1	123.4	3.08	2	606	Clouds.
1879.686		123.55	3.110			

δ Cygni = Σ. 2579.

$\alpha = 19^h\ 41^m.2 \quad \delta = 44°\ 50'$ (3 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1876.723	19.4	339.4	1.21	2	383	Images bad.
6.737	. .	334.3	1.50	2	383	
6.745	18.7	331.3	1.66	2	383	
6.748	18.7	333.6	1.67	2	383	
1876.740		333.97	1.553			

O. Σ. 387.

$\alpha = 19^h\ 44^m.3 \quad \delta = 35°\ 0'$ (7.5 and 8).

1876.748	19.0	115.1	0.50	2	383	
6.759	19.1	110.3	0.50	2	606	Stars of 9th mag.
6.786	19.7	106.9	0.45	3	606	
8.714	18.7	17.4	0.48	3	606	
8.717	18.8	18.6	. .	1	606	Images bad; an error of 90° in this angle in 1876.
8.719	18.7	17.6	0.48	3	606	
9.694	19.1	190.7	0.51	3	888	
9.697	19.2	14.2	0.44	3	888	
1878.197		17.53	0.480			

β Aquilæ = O. Σ. 532.

$\alpha = 19^h\ 49^m.4 \quad \delta = 6°\ 6'$ (3 and 12).

1879.636	19.2	17.0	12.24	3	383	
9.639	19.2	15.4	12.23	2	383	Clouds.
9.678	19.8	16.0	12.38	2	383	
9.680	20.1	16.8	12.40	2	606	
1879.658		16.30	12.312			

Σ. 2607. *A* and *B*.

$\alpha = 19^h\ 53^m.9 \quad \delta = 41°\ 57'$ (7 and 9).

1879.694	19.6	313.9	0.40	2	888	
9.697	19.6	309.0	0.32	2	888	
1879.695		311.45	0.360			

$\frac{A+B}{2}$ and *C*. (7 and 9).

1879.694	19.3	293.4	3.17	3	606	
9.697	19.5	293.3	3.27	2	888	
1879.695		293.35	3.220			

Σ. 2658.

$\alpha = 20^h\ 10^m.5 \qquad \delta = 52° \ 45'$ (7 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.699	19.5	119.4	5.40	2	606	
9.708	19.5	118.9	5.43	2	606	
1879.703		119.15	5.415			

α^2 Capricorni. *B* and *C*.

$\alpha = 20^h\ 11^m.4 \qquad \delta = -12° \ 55'$ (12 and 13).

1875.719	. .	245.2	1.14	2	383	*s* uncertain.
6.723	19.8	243.1	. .	2	383	Sky became hazy.
8.714	19.0	240.7	1.28	3	383	
8.719	20.0	240.6	0.94	2	383	
9.768	19.7	243.0	1.25	2	606	Faint.
1877.929		242.52	1.152			

O. Σ. 406.

$\alpha = 20^h\ 15^m.9 \qquad \delta = 45° \ 1'$ (7 and 8).

1879.710	19.5	111.9	0.48	2	888	
9.713	19.2	104.5	0.54	2	888	
9.719	19.5	104.6	0.46	3	888	
9.765	19.6	110.5	0.50	3	888	
1879.727		107.88	0.495			

Σ. 2673.

$\alpha = 20^h\ 17.^m1 \qquad \delta = 12° \ 57'$ (8 and 10).

1879.688	19.6	333.0	2.46	2	383	
9.691	19.8	331.3	2.62	2	606	
1879.690		332.15	2.540			

Σ. 2690 A and $\frac{B+C}{2}$.

$\alpha = 20^h\ 25^m.4 \qquad \delta = 10° \ 52'$. (7 and 8).

1879.732	20.3	255.6	15.40	2	606	
9.735	19.0	255.7	15.46	2	606	
1879.734		255.65	15.430			
	$\Delta\rho =$	0.00	+ 0.004			
		255.65	15.434			

B and *C*.

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	"			
1879.732	20.5	209.6	0.52	2	888	
9.735	18.8	213.6	0.46	2	888	
1879.734		211.60	0.490			

Σ. 2696.

$\alpha = 20^h\ 27^m.6 \quad \delta = 5°\ 1'$ (8 and 9).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1879.732	20.7	301.1	0.94	2	606	
9.735	19.2	306.7	0.85	2	606	
9.749	20.7	304.4	0.75	3	606	
1879.739		304.07	0.847			

O. Σ. 533.

$\alpha = 20^h\ 33^m.4 \quad \delta = 9°\ 40'$ (5 and 11).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1879.694	20.7	326.6	11.45	3	383	
9.697	21.4	324.0	11.37	2	383	Comp. 13th mag.
1879.696		325.30	11.410			
	Δρ =	0.00	+ 0.004			
		325.00	11.414			

Σ. 2708. *A* and *B*.

$\alpha = 20^h\ 34^m.1 \quad \delta = 38°\ 13'$ (7 and 9).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1876.786	20.0	334.0	21.71	3	383	
6.817	21.1	333.6	21.79	3	383	
1876.801		333.80	21.750			
	Δρ =	0.00	+ 0.006			
		333.80	21.756			

Σ. 2708. *A* and *C*. (7 and 15).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1876.786	20.2	49.3	14.98	3	383	*C* is 15th mag.
9.765	19.9	46.2	14.96	3	606	*C* is 15th–16th mag.
1878.276		47.75	14.970			
	Δρ =	0.00	+ 0.004			
		47.75	14.974			

Σ. 2725.

$\alpha = 20^h\ 40^m.6 \quad \delta = 15^\circ\ 28'$ (7 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.683	20.7	0.9	4.94	2	606	
9.688	20.8	0.9	5.18	2	383	
9.691	20.3	0.1	5.00	2	606	
1879.687		0.63	5.040			

γ Delphini = Σ. 2727.

$\alpha = 20^h\ 41^m.4 \quad \delta = 15^\circ\ 41'$ (4 and 6).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1879.735	19.6	270.5	11.30	2	383	
9.741	22.4	272.0	11.23	2	606	
9.749	21.0	271.3	11.50	3	606	
9.765	20.3	271.0	11.37	3	606	
1879.748		271.20	11.350			
	$\Delta\rho =$	0.00	+ 0.003			
		271.20	11.353			

O. Σ. 413.

$\alpha = 20^h\ 42^m.7 \quad \delta = 36^\circ\ 3'$ (6 and 7).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1876.786	20.4	83.6	0.71	2	606	
6.825	20.7	85.0	0.78	2	888	
8.714	19.9	82.6	0.50	2	888	Very blazing images.
8.719	19.3	87.3	0.63	2	606	Images blazing.
9.730	20.4	83.4	0.69	3	888	
9.732	20.0	82.8	0.75	2	606	
1878.418		84.18	0.677			

Σ. 2729.

$\alpha = 20^h\ 45^m.1 \quad \delta = -6^\circ\ 4'$ (6 and 7).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1879.754	20.2	155.6	0.38	3	888	
9.760	19.5	155.6	0.43	2	888	
9.762	20.1	156.1	0.40	3	888	
9.768	19.5	156.2	0.39	3	888	
1879.761		155.88	0.400			

O. Σ. 418.

$\alpha = 20^h\ 49^m.9$ $\delta = 32^\circ\ 15'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.716	18.6	110.5	1.03	3	606	
9.719	19.3	111.8	1.00	3	606	
1879.718		111.15	1.015			

O. Σ. 423.

$\alpha = 20^h\ 50^m.9$ $\delta = 42^\circ\ 4'$ (7 and 9).

1878.714	20.3	77.5	2.69	3	383	
8.719	19.6	80.0	2.75	3	606	
9.710	20.0	78.8	2.84	2	606	
9.713	19.6	80.7	2.86	2	606	
1879.214		79.25	2.785			

Σ. 2737. *A* and *B*.

$\alpha = 20^h\ 53^m.1$ $\delta = 3^\circ\ 50'$ (6 and 7).

1879.694	21.1	284.6	1.06	2	606	
9.710	20.4	285.4	1.04	2	606	
1879.702		285.00	1.050			

Σ. 2737. *A* and *C*. (6 and 8).

1879.694	20.9	73.6	10.68	3	606	
9.710	20.6	74.2	10.63	2	606	
1879.702		73.90	10.655			
	$\Delta \rho$	0.00	+ 0.003			
		73.90	10.658			

Σ. 2741.

$\alpha = 20^h\ 54^m.6$ $\delta = 49^\circ\ 59'$ (6 and 7).

1879.699	20.6	30.3	1.95	2	606	
9.708	19.8	32.9	1.90	2	606	
1879.704		31.60	1.925			

Σ. 2744.

$\alpha = 20^h\ 57^m.0$ $\delta = 1^\circ\ 4'$ (6 and 7).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.694	21.4	172.7	1.47	3	606	
9.708	20.7	172.2	1.54	2	606	
1879.701		172.45	1.505			

Σ. 2746.

$\alpha = 20^h\ 57^m.1$ $\delta = 38^\circ\ 46'$ (8 and 9).

1879.710	20.2	293.3	1.05	2	606	
9.713	19.9	289.7	1.04	2	606	
1879.712		291.50	1.045			

Anonyma.

$\alpha = 21^h\ 1^m.0$ $\delta = 21^\circ\ 8'$ (6 and 8).

1875.921	0.0	64.4	. .	2	606	

61 Cygni.

$\alpha = 21^h\ 1^m.3$ $\delta = 38^\circ\ 8'$ (6 and 6).

1879.699	21.0	117.4	20.15	2	383	
9.708	20.2	117.2	20.07	2	383	
9.710	19.1	117.9	20.04	3	383	
9.713	20.2	117.9	19.83	3	383	
9.716	19.3	117.9	19.86	2	606	
9.719	19.7	117.8	19.89	3	606	
1879.711		117.68	19.973			
	$\Delta\rho =$	0.00	+0.006			
		117.68	19.979			

Σ. 2760.

$\alpha = 21^h\ 1^m.9$ $\delta = 33^\circ\ 38'$ (7 and 8).

1879.713	20.5	225.3	8.61	2	383	
9.716	18.9	224.8	8.57	3	606	
9.719	20.0	225.2	8.48	3	606	
1879.716		225.10	8.553			

Anonyma.

$\alpha = 21^h\ 5.^m7$ $\delta = -15^\circ\ 31'$ (8 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1879.735	19.8	142.2	3.11	2	383	
9.749	21.3	322.6	3.10	3	606	
1879.742		322.40	3.105			

Σ. 2777.

$\alpha = 21^h\ 8^m.6$ $\delta = 9^\circ\ 31'$ (4 and 10).

1879.754	With powers 800 A and 1300 I am not certain that this star is double.
9.768	Powers 800 A and 1300; the star seems to be elongated in $p = 150^\circ$, but I am not certain of its duplicity.

τ Cygni.

$\alpha = 21^h\ 10^m.0$ $\delta = 37^\circ\ 32'$ (5 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1876.896	21.7	161.9	1.04	2	606	
6.901	22.1	158.5	1.03	2	888	
8.714	21.0	154.4	. .	1	888	
8.807	20.8	163.2	1.09	2	606	
9.730	20.6	153.2	1.03	3	888	
9.749	20.4	147.8	1.00	2	606	
9.751	20.1	146.3	. .	2	888	
9.754	19.6	142.4	0.99	3	888	
9.763	19.6	148.0	0.90	3	888	
9.768	19.3	146.3	0.99	.	. .	
1876.898		160.20	1.035			
1878.760		158.80	1.09			
1879.752		147.33	0.982			This star was discovered by Mr. A. G. Clark.

τ' Cygni.

1876.901	21.8	260.3	15.68	2	383	15th mag.

Σ. 2799.

$\alpha = 21^h\ 23^m.0$ $\delta = 10^\circ\ 34'$ (7 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1878.714	21.2	132.5	1.29	3	383	
8.719	20.5	132.7	1.32	2	383	
1878.716		132.60	1.305			

Σ. 2804.

$\alpha = 21^h\ 27^m.4$ $\delta = 20°\ 11'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1878.719	20.7	328.6	2.88	3	383	
8.818	21.0	328.8	2.79	3	606	
1878.768		328.70	2.835			

Anonyma.

$\alpha = 21^h\ 32^m.0$ $\delta = -16°\ 10'$ (8.5 and 13).

1875.902	23.3	125.0	2.17	2	383	
9.754	20.8	123.4	2.10	2	606	
1877.828		124.20	2.135			

μ Cygni = Σ. 2822.

$\alpha = 21^h\ 38^m.7$ $\delta = 28°\ 13'$ (5 and 6).

1878.845	21.7	118.2	3.79	3	383	
8.848	22.2	119.3	3.68	3	383	
9.754	19.9	119.8	3.65	3	606	
9.760	19.2	120.6	3.65	3	383	
9.762	19.9	119.1	3.74	3	606	
1879.394		119.40	3.702			

Σ. 2847.

$\alpha = 21^h\ 51^m.9$ $\delta = -4°\ 4'$ (8 and 8).

1879.732	21.3	303.6	1.30	2	606	
9.735	20.1	305.8	1.22	2	606	
1879.734		304.70	1.260			

Σ. 2872. A and $\frac{B+C}{2}$.

$\alpha = 22^h\ 4^m.5$ $\delta = 58°\ 41'$ (6 and 7).

1879.730	20.9	315.9	21.62	3	606	
9.738	19.7	316.3	21.69	3	606	
1879.734		316.10	21.655			
	$\Delta\rho =$	− 0.01	+ 0.006			
		316.09	21.661			

B and *C*. (7 and 8).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.730	21.1	142.1	0.68	3	888	
9.738	19.9	145.8	0.69	3	606	
1879.734		143.95	0.685			

Σ. 2881.

$\alpha = 22^h\ 9^m.1$ $\delta = 28^\circ\ 57'$ (7 and 8).

1879.732	21.5	101.7	1.61	2	606	
9.735	20.4	105.0	1.60	2	606	
1879.734		103.35	1.605			

30 Pegasi. *A* and *B*.

$\alpha = 22^h\ 14^m.4$ $\delta = 5^\circ\ 11'$ (6 and 12).

1875.721	. .	21.0	6.23	3	383	
5.803	. .	17.6	6.38	3	383	
5.823	. .	18.5	. .	.	383	
9.732	22.0	18.6	6.36	2	606	
1876.770		18.92	6.323			

A and *C*. (6 and 12).

1875.721	. .	221.2	9.70	3	383	
5.803	. .	221.8	9.91	3	383	
5.823	. .	219.0	. .	2	383	
9.732	21.8	222.4	10.21	2	606	
1876.770		221.10	9.940			

Σ. 2895.

$\alpha = 22^h\ 15^m.1$ $\delta = 24^\circ\ 20'$ (8 and 10).

1879.732	22.3	29.2	6.85	2	606	
9.735	20.7	28.6	6.82	2	606	
1879.734		28.90	6.835			

34 Pegasi.

$\alpha = 22^h\ 20^m.5$ $\delta = 3°\ 47'$ (6 and 13).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1875.719	. .	225.9	2.56	3	383	
5.828	. .	220.7	2.66	2	606	
1875.774		223.30	2.610			

ζ Aquarii = Σ. 2909.

$\alpha = 22^h\ 22^m.6$ $\delta = -0°\ 38'$ (4 and 5).

1875.908	. .	337.4	4.11	1	383	Diffuse images.
5.921	0.5	331.8	3.61	3	606	
5.970	0.5	333.9	3.91	3	383	
5.976	1.0	332.1	3.84	3	383	
8.870	22.2	156.3	3.49	3	383	
8.873	22.3	335.2	3.39	2	383	
8.875	22.0	334.9	3.45	3	383	
9.735	21.0	332.6	3.59	2	383	
9.738	22.1	332.6	3.46	2	383	
9.741	22.1	333.4	3.26	3	606	
9.749	21.6	333.4	3.31	3	606	
1878.123		333.96	3.565			

Σ. 2920. *A* and *B*.

$\alpha = 22^h\ 28^m.2$ $\delta = 3°\ 32'$ (7 and 8).

1878.870	22.5	143.4	13.71	3	383	
8.873	22.5	143.3	13.60	3	383	
1878.872		143.35	13.655			
	$\Delta\rho =$	0.00	+ 0.005			
		143.35	13.660			

A and *C*.

1878.873	22.7	62.5	22.20	3	383	*C* is 14th mag.

Lalande 44276.

$\alpha = 22^h\ 33^m.2$ $\delta = -13°\ 14'$ (9 and 9.2).

1879.754	22.1	137.0	4.42	3	606	
9.768	22.0	316.3	4.36	3	606	
1879.761		316.65	4.390			

O. Σ. 477.

$\alpha = 22^h\ 38^m.3$ $\delta = 45°\ 21'$ (7 and 11).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1879.738	21.3	152.7	5.03	3	606	
9.752	19.8	153.3	4.99	2	383	
1879.745		153.00	5.010			

Bradley 3011.

$\alpha = 22^h\ 41^m.6$ $\delta = -4°\ 51'$ (8 and 8).

1879.754	21.3	252.8	3.54	3	606	
9.768	21.8	253.6	3.71	3	606	
1879.761		253.20	3.625			

O. Σ. 536.

$\alpha = 22^h\ 52^m.6$ $\delta = 8°\ 44'$ (8 and 8).

1879.754	22.4	167.2	0.36	3	888	
9.768	22.5	166.5	0.35	3	888	
9.776	22.9	168.3	0.37	3	888	
1879.766		167.33	0.360			

O. Σ. 483.

$\alpha = 22^h\ 53^m.2$ $\delta = 11°\ 5'$ (6 and 8).

1878.818	21.3	208.3	0.98	3	606	
9.754	22.6	206.1	1.08	3	888	
9.768	22.3	206.4	1.11	3	606	
9.776	22.7	205.7	1.05	3	606	
1879.529		206.62	1.055			

Σ. 2978.

$\alpha = 23^h\ 1^m.7$ $\delta = 32°\ 11'$ (7 and 8).

1878.870	23.0	143.8	8.52	3	383	
8.873	22.8	144.7	8.54	2	383	
1878.871		144.25	8.530			

Σ. 2989.

$\alpha = 23^h\ 7^m.2$ $\delta = 19°\ 20'$ (9 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.818	21.6	142.0	1.64	3	606	
8.826	21.5	141.8	1.64	2	606	
1878.822		141.90	1.640			

Σ. 3001.

$\alpha = 23^h\ 13^m.7$ $\delta = 67°\ 27'$ (6 and 8).

1879.820	21.9	193.4	2.52	2	383	
9.828	22.7	191.9	2.85	3	383	
9.831	22.9	193.1	2.77	3	383	
9.834	21.3	195.5	2.76	3	606	
1879.828		193.48	2.725			

Σ. 3006.

$\alpha = 23^h\ 15^m.4$ $\delta = 34°\ 47'$ (8 and 9).

1879.768	23.0	171.1	5.25	3	606	
9.776	23.2	170.5	5.32	3	606	
1879.772		170.80	5.285			

Σ. 3008.

$\alpha = 23^h\ 17^m.5$ $\delta = -9°\ 7'$ (7 and 8).

1879.751	23.0	254.3	4.95	2	383	
9.754	23.8	255.6	4.92	3	606	
9.768	23.3	254.3	4.93	3	606	
1879.758		254.73	4.933			

O. Σ. 500.

$\alpha = 23^h\ 31^m.7$ $\delta = 43°\ 46'$ (6 and 7).

1879.793	23.3	313.4	0.53	2	888	
9.803	23.0	317.2	0.48	3	888	
9.817	22.6	318.8	0.54	3	606	
1879.804		316.47	0.517			

O. Σ. 513.

$a = 23^h\ 52^m.2 \qquad \delta = 34°\ 22'$ (7 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1878.856	23.5	21.9	3.62	3	383	
8.859	21.9	25.8	3.55	3	383	
8.867	22.7	22.5	3.63	3	383	
1878.861		23.40	3.600			

Anonyma.

$a = 23^h\ 58^m.5 \qquad \delta = 45°\ 0'$ (9 and 10).

1879.793	23.6	338.8	4.35	2	606	
9.817	22.9	341.6	4.15	2	383	
1879.805		340.20	4.250			This star was observed for O. Σ. 547.

O. Σ. 547.

$a = 23^h\ 59^m.2 \qquad \delta = 45°\ 9'$ (8 and 8).

1879.803	23.3	293.9	4.33	3	606	
9.817	23.1	294.0	4.38	3	383	
1879.810		293.95	4.355			

Σ. 3060.

$a = 23^h\ 59^m.5 \qquad \delta = 17°\ 25'$ (8 and 9).

1878.845	22.1	117.8	3.56	3	383	
8.848	22.7	116.9	3.68	3	383	
8.867	23.1	117.9	3.77	2	383	
1878.853		117.53	3.670			

Σ. 3061.

$a = 23^h\ 59^m.5 \qquad \delta = 17°\ 10'$ (8 and 8).

1878.818	21.9	147.6	7.75	3	606	
8.826	21.8	147.4	7.72	2	606	
1878.822		147.50	7.735			

Σ. 3062.

$\alpha = 23^h\ 59^m.9 \quad \delta = 57^\circ\ 46'$ (7 and 8).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1879.062	2.8	301.5	1.57	3	606	
9.064	2.3	301.2	1.46	2	383	
9.081	3.6	300.2	1.38	3	383	
9.084	2.7	301.6	1.40	3	383	
9.820	22.3	302.6	1.56	2	383	
9.828	22.9	302.8	1.61	3	606	
9.831	23.1	302.9	1.51	2	606	
9.834	21.5	302.2	1.48	3	606	
1879.450		301.88	1.496			

§ 8.

THE COMPANION OF SIRIUS.

The companion of Sirius was discovered by Mr. Alvan G. Clark at Cambridge, January 31, 1862, with the 18½-inch objective, made by Alvan Clark & Sons for the University of Mississippi, and afterward mounted at Chicago. This interesting discovery appeared to confirm the theory which Bessel had drawn from the variable proper motion of Sirius, and the attention of astronomers was naturally turned to this companion, which has been frequently observed. The earliest observations are those made by Professor G. P. Bond with the 15-inch refractor of the Harvard College Observatory. I assisted Professor Bond in those observations, and saw the companion on several nights. Generally it was a difficult object in the Harvard College telescope, since the images of the stars were often very unsteady, and the companion was partially hidden in the rays of the bright star. On joining the Naval Observatory in the summer of 1862, I found that Mr. Ferguson and Captain Gilliss, the Superintendent, had looked for this companion with the 9.6-inch Equatorial on many nights, but without success. Several trials were again made by Mr. Ferguson and myself in 1863 and in 1864, but these being unsuccessful, the object was given up as being too difficult for the Washington telescope. On making a trial, however, in the twilight on March 13, 1866, I saw the companion without the least difficulty, it being as easily seen as the companion of Rigel. I observed the companion of Sirius with the 9.6-inch Equatorial in the years 1866, 1872, and 1873. These observations were made with difficulty, the driving-clock of this instrument not performing well; and the observations are not so good as those made with the 26-inch refractor, but for the sake of completeness they are given below. The angle observed in 1873 has probably an error of + 5°.

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1866.199	7.4	76.4	9.54	.	280	The night very fair; p good, s doubtful.
6.238	7.0	. .	10.67	.	280	The night bad.
6.257	. .	71.7	10.32	.	280	The night very good.
1872.149	. .	65.9	. .	2	202	
2.239	. .	62.9	10.82	2	202	
2.242	. .	64.3	. .	3	202	
2.245	. .	64.5	11.71	4	279	
2.256	. .	64.6	11.60	3	279	
2.264	. .	64.1	11.28	2	279	
2.280	. .	63.5	11.90	2	279	
1873.203	. .	65.8	11.12	2	279	Two comparisons.
1874.232	7.7	57.6	11.04	2	412	This observation and the following were made with the 26-inch refractor.
4.235	7.7	58.5	11.17	3	412	
1875.265	8.0	56.6	10.99	3	606	
5.270	8.1	56.2	11.36	3	606	
5.287	. .	56.1	11.01	2	392	
5.306	. .	56.6	10.95	2	392	
1876.174	6.8	55.3	11.26	2	383	
6.187	6.6	56.0	11.18	2	383	
6.190	6.7	55.2	11.42	2	383	
6.228	8.1	55.4	11.07	3	383	
6.267	7.9	54.9	11.07	3	383	
6.272	8.3	54.5	11.16	2	383	
1877.228	6.7	53.8	10.99	2	606	
7.258	7.5	53.3	10.87	2	606	Images blazing.
7.263	7.9	53.3	10.96	2	606	
7.266	8.0	53.1	10.93	2	606	Faint through thin clouds.
7.269	8.0	53.4	10.99	3	606	
1878.232	6.9	52.3	10.91	2	606	
8.235	7.3	51.6	10.81	3	606	
8.243	7.0	51.1	10.61	2	606	Images very unsteady.
8.254	7.5	51.3	10.79	2	606 p 383 s	Very unsteady.
8.263	7.5	52.2	10.70	3	606	
1879.191	6.9	50.0	10.33	2	383	Images unsteady.
9.193	7.2	50.4	10.74	2	383	
9.196	5.8	49.9	10.53	4	383	
9.199	6.0	50.7	10.46	2	383	Comp. faint.
9.212	6.3	50.4	10.67	3	383	
9.215	6.7	49.4	10.57	2	383	Images unsteady.

The following are the mean results of these observations:

Date.	p	s	Number of observations.		Date.	p	s	Number of observations.	
	°	″				°	″		
1866.231	74.05	10.212	2.	3.	1876.220	55.22	11.193	6.	6.
1872.239	64.26	11.462	7.	5.	1877.257	53.38	10.948	5.	5.
1873.203	65.8	11.12	1.	1.	1878.245	51.70	10.764	5.	5.
1874.233	58.05	11.105	2.	2.	1879.201	50.13	10.550	6.	6.
1875.282	56.38	11.078	4.	4.					

In the case of these observations each single observation made with the 26-inch refractor depends on five settings of the position circle, and on five measurements of the double distance. From the 28 observations I find the following values of the probable errors of a single observation:

Probable error of a single angle of position $= \pm 0^\circ.272$
" at $s = 11''.00$, $= \pm 0''.052$
" of a single distance, $= \pm 0''.079$

In deriving the mean results all the observations have been given the same weight except the first two distances observed in 1866, which have been given a weight of one-half.

§ 9.

THE RING NEBULA IN LYRA.

$\alpha = 18^h\ 49^m.1 \qquad \delta = 32^\circ\ 52'$

In the following observations of the faint stars near this nebula the stars are designated by the letters *a*, *b*, *c*, etc., *a* being the brightest of these stars, and the one near the following end of the nebula. The angles and distances are referred to *a*, except in the case of the companion of the triple star *f*, where these quantities are referred to *f* itself. My estimated magnitudes of these stars are probably too bright, but they are given as they were made. Each measure is the result of two settings of the position circle for the angle, and of two measures of the double distance.

a and *b*. 10 and 14).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1877.580	18.0	225.6	93.93	2	383	
7.583	. .	225.4	93.87	3	383	
1877.582		225.50	93.90			

a and *c*. (10 and 13.14).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.580	18.2	268.2	115.85	2	383	
7.583	. .	267.8	115.82	3	383	
1877.582		268.00	115.84			

a and *d*. (10 and 12.13).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1877.591	17.3	287.0	138.68	3	383	
7.594	16.5	286.8	138.49	2	383	
1877.592		286.90	138.58			

a and *e*. (10 and 12).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
	h.	°	″			
1877.591	17.5	292.6	123.15	3	383	
7.594	16.7	292.6	122.66	2	383	
1877.592		292.60	122.90			

a and *f*. (10 and 13.14).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1877.580	17.8	313.7	101.43	2	383	
7.583	. .	313.7	102.16	3	383	
1877.582		313.70	101.79			

a and *g*. (10 and 13).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1877.591	17.6	351.1	77.18	3	383	
7.594	. .	350.1	77.18	2	383	
1877.592		350.60	77.18			

f and f_1. (13.14 and 13.14).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1877.591	. .	255.1	3.73	3	383	
7.594	. .	251.5	4.19	2	383	
1877.592		253.30	3.96			

f and f_2. (13.14 and 14.15).

Date.	Sid. Time.	*p*	*s*	Wt.	Power.	Remarks.
1877.591	. .	5.9	17.81	3	383	
7.594	. .	3.7	16.82	2	383	
1877.592		4.80	17.32			

The following estimates were made to connect the nebula with the stars:

(*α*) The right line *a* to *b* is 11″ outside of the nebula.
(*β*) The right line *a* to *c* very nearly bisects the darker, interior part of the nebula.
(*γ*) The right line *a* to *f* is very nearly tangent to the nebula.
(*δ*) The right line *b* to *c* is nearly tangent to the nebula.

During these observations no star was seen inside the above ring of stars, nor any star within the nebula itself. Afterwards it was thought that a star was seen within the nebula, but I could not measure it.

OBSERVATIONS MADE WITH THE 9.6-INCH EQUATORIAL.

While making his observations at Santiago, Chili, Captain Gilliss observed the differences of right ascension and declination of a number of double stars, and from these observed differences he had his computers determine the angles of position and the distances of the stars. Being desirous of comparing the accuracy of such angles and distances with that of those found by observing with a filar micrometer, Captain Gilliss directed me in 1863 to observe certain double stars with our 9.6-inch refractor. These observations were made under unfavorable circumstances, the driving-clock of this instrument being very troublesome, but a comparison showed that the positions found with the filar micrometer were decidedly better than those deduced from the observed differences of right ascension and declination.

The following are the stars observed by me in 1863. These observations were made soon after the object-glass had been refigured by Alvan Clark & Sons, and before the value of a revolution of the screw of the micrometer had been well determined. I have, therefore, revised my former reductions, and have computed the distances with the value of a revolution.

$$R = 15''.3014$$

The approximate values of the right ascensions and declinations are given for 1880.0.

11 Monocerotis = Σ. 919. *A* and *B*.

$\alpha = 6^h\ 22^m.)$ $\delta = -6^\circ\ 56'$ (5 and 6).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	''			
1863.205	. .	130.1	7.47	3	280	
			A and *C*.			
1863.205	. .	123.0	9.81	3	280	Clouds; only one measure of distance.
			B and *C*.			
1863.205	. .	106.8	. .	3	280	Clouds.

2 Navis = Σ. 1138.

$\alpha = 7^h\ 39^m.9$ $\delta = -14^\circ\ 24'$ (6 and 7).

1863.243	8.2	338.6	16.70	2	280	

5 Navis = Σ. 1146.

$\alpha = 7^h\ 42^m.3$ $\delta = -11^\circ\ 54'$ (5 and 7).

1863.197	8.5	15.8	3.82	3	280	

φ^2 Cancri = Σ. 1223.

$\alpha = 8^h\ 19^m.6$ $\delta = 27^\circ\ 20'$ (6 and 6.5).

1863.268	11.4	214.5	4.97	3	280	

ν^1 Cancri = Σ. 1224.

$\alpha = 8^h\ 19^m.7$ $\delta = 24^\circ\ 55'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1863.268	10.3	39.8	5.98	4	280	

P. 108 = Σ. 1245.

$\alpha = 8^h\ 29^m.4$ $\delta = 7^\circ\ 3'$ (6 and 8).

1863.172	. .	25.8	10.40	3	280	
3.197	. .	25.8	10.49	3	280	
1863.184		25.80	10.44			

P. 160 = Σ. 1270.

$\alpha = 8^h\ 39^m.3$ $\delta = -2^\circ\ 9'$ (6.6 and 7.6).

1863.243	9.7	260.1	4.88	3	280	

Σ. 66.

$\alpha = 10^h\ 37^m.1$ $\delta = 5^\circ\ 23'$ (6 and 7).

1863.236	10.3	240.6	6.42	3	280	
3.301	10.8	239.1	6.94	2	280	
1863.268		239.85	6.68			

Σ. 1482.

$\alpha = 10^h\ 45^m.9$ $\delta = 8^\circ\ 7'$ (8 and 9).

1863.292	11.4	304.9	11.32	3	280	

51 Leonis = Σ. 1487.

$\alpha = 10^h\ 49^m.1$ $\delta = 25^\circ\ 24'$ (5 and 7).

1863.292	12.6	102.2	6.33	3	280	

Σ. 1540.

$\alpha = 11^h\ 20^m.7$ $\delta = 3^\circ\ 40'$ (6 and 7).

1863.301	12.5	149.7	30.12	2	280	

Σ. 1604. A and B.

$\alpha = 12^h\ 3^m.3$ $\delta = -11° 11'$ (6.5 and 9).

Date.	Sid Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1863.312	12.8	94.6	11.38	3	280	

A and C.

1863.312	12.8	94.6	48.51	3	280	

Σ. 1636.

$\alpha = 12^h\ 16^m.4$ δ 5° 58′ (6 and 9).

1863.312	13.2	335.4	19.96	3	280	

5 Serpentis = Σ. 1930.

$\alpha = 15^h\ 13^m$ $\delta = 2° 14'$ (5 and 10).

1863.607	17.3	40.6	10.59	3	280	

51 Libræ.

$\alpha = 15^h\ 57^m.7$ $\delta = -11° 2'$ (6 and 9).

1863.499	. .	70.6	7.02	2	280	
3.542	. .	68.9	7.49	3	280	
1863.520		69.75	7.255			

Σ. 1999.

$\alpha = 15^h\ 57^m.7$ $\delta = -11° 7'$ (7.5 and 8).

1863.499	. .	100.6	10.72	2	280	

β Scorpii.

$\alpha = 15^h\ 58^m.5$ $\delta = -19° 29'$ (2 and 4).

1863.599	18.3	24.5	13.97	3	280	

α Herculis = Σ 2140.

$\alpha = 7^h\ 9^m.2$ $\delta = 14° 32'$ (3 and 6).

1863.580	19.7	116.5	4.26	3	280	

Σ. 2149.

$\alpha = 17^h\ 13^m.6 \qquad \delta = -6^\circ\ 16'$ (9 and 9).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1863.608	18.4	23.9	7.82	3	280	

ν Serpentis.

$\alpha = 17^h\ 14^m \qquad \delta = -12^\circ\ 43'$ (6 and 10).

1863.608	17.8	31.6	48.09	3	280	

Σ. 2204.

$\alpha = 17^h\ 39^m.7 \qquad \delta = -13^\circ\ 14'$ (7 and 7).

1863.608	19.0	24.7	14.90	3	280	

Σ. 2234.

$\alpha = 17^h\ 46^m.4 \qquad \delta = -7^\circ\ 56'$ (8.6 and 9).

1863.619	18.6	198.9	17.41	2	280	

Σ. 2244.

$\alpha = 17^h\ 50^m.8 \qquad \delta = 0^\circ\ 7'$ (7 and 7).

1863.633	18.3	276.1	0.85	3	400	

Σ. 2245.

$\alpha = 17^h\ 51^m.2 \qquad \delta = 18^\circ\ 21'$ (7 and 7).

1863.619	20.1	295.7	2.98	3	400	

70 Ophiuchi = Σ. 2272.

$\alpha = 17^h\ 59^m.3 \qquad \delta = 2^\circ\ 33'$ (4 and 6).

1863.608	20.2	106.9	5.75	3	280	
3.619	19.2	106.1	6.05	3	280	
3.633	17.6	104.9	5.88	3	400	
3.671	18.1	105.0	5.65	3	400	
3.677	19.0	104.8	5.73	3	400	
1863.642		105.54	5.81			

73 Ophiuchi = Σ. 2281.

$\alpha = 18^h\ 3^m.4$ $\delta = 3^\circ\ 58'$ (6 and 7).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1863.633	18.6	257.7	1.38	4	400	

Σ. 2287.

$\alpha = 18^h\ 4^m.4$ $\delta = 2^\circ\ 35'$ (10 and 10).

1863.633	19.1	150.8	22.22	3	280	

Σ. 2288.

$\alpha = 18^h\ 4^m.4$ $\delta = 2^\circ\ 31'$ (9 and 11).

1863.633	19.7	63.0	16.18	3	280	

59 Serpentis = Σ. 2316.

$\alpha = 18^h\ 21^m.1$ $\delta = 0^\circ\ 6'$ (6 and 8).

1863.633	20.1	312.7	4.09	3	400	

Σ. 2391.

$\alpha = 18^h\ 42^m.4$ $\delta = -6^\circ\ 8'$ (7 and 10).

1863.633	20.5	331.5	38.87	3	280	

θ Serpentis = Σ. 2417.

$\alpha = 18^h\ 50^m.4$ $\delta = 4^\circ\ 1'$ (4 and 4).

1863.633	20.9	104.5	22.19	3	400	
3.671	18.9	102.9	21.76	3	400	
1863.652		103.70	21.975			

Σ. 2447.

$\alpha = 19^h\ 0^m.2$ $\delta = -1^\circ\ 31'$ (7 and 9).

1863.651	20.7	342.1	14.35	2	400	

Σ. 2601.

$\alpha = 19^h\,50^m.7 \quad \delta = 1^\circ\,36'$ (8 and 10).

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	″			
1863.676	19.6	163.9	7.65	3	280	

Σ. 2612.

$\alpha = 19^h\,55^m.6 \quad \delta = 6^\circ\,36'$ (8 and 9).

1863.676	20.4	53.1	38.18	3	280	

Σ. 2613.

$\alpha = 19^h\,55^m.7 \quad \delta = 10^\circ\,24'$ (7 and 8).

1863.676	21.4	347.5	4.29	2	400	

§ 10.

TABLES FOR COMPUTING REFRACTION.

If φ be the latitude of the place of observation, and we denote by δ and t the declination and hour angle of a star, by z its zenith distance, and by q the parallactic angle, we have from the spherical triangle between the pole, the zenith, and the star:

$$\begin{aligned} \cos z &= \sin\varphi \sin\delta + \cos\varphi\cos\delta\cos t \\ \sin z \cos q &= \sin\varphi\cos\delta - \cos\varphi\sin\delta\cos t \\ \sin z \sin q &= \cos\varphi \sin t \end{aligned}$$

If we put

$$\begin{aligned} \sin n &= \cos\varphi \sin t \\ \cos n \sin N &= \cos\varphi\cos t \\ \cos n \cos N &= \sin\varphi \end{aligned}$$

we shall have for computing z and q;

$$\begin{aligned} \operatorname{tang} z \sin q &= \operatorname{tang} n.\ \operatorname{cosec}(N+\delta) \\ \operatorname{tang} z \cos q &= \operatorname{cotang}(N+\delta). \end{aligned}$$

Generally we may use for equatorial observations the simple formula for refraction,

$$\Delta z = k.\ \operatorname{tang} z:$$

where $k = 57''.65$. The corrections for the observed hour angle and declination are

$$\Delta t = +\frac{k.\ \cos\varphi\sin t}{\cos n\cos\delta\sin(N+\delta)} = +\frac{k.\ \operatorname{tang} t\sin N}{\cos\delta\sin(N+\delta)}:$$

$$\Delta\delta = -k.\ \operatorname{cotang}(N+\delta).$$

For computing the differential refraction for the distance and the angle of position, we have the following formulæ given by Bessel, *Astronomische Untersuchungen*, Bd. I, p. 165.

$$\sigma = s'' + s''.\,\frac{k}{206265}\left\{\text{tang } z^2 \cos (p - q)^2 + 1\right\},$$

$$\pi = p^\circ - \frac{k}{3600}\left\{\text{tang } z^2 \cos (p - q) \sin (p - q) + \text{tang } z \sin q \text{ tang } \delta\right\}.$$

In these formulæ s and p are the observed values of the distance and angle of position, and σ and π are the corrected values. The other symbols have the meanings given above.

The following table gives for the latitude of the Naval Observatory $\varphi = + 38^\circ\ 53'.65$, the values of N, log *cos n*, and log *tang n*, for each minute of the hour angle. The first hour of this table was computed directly, and for the rest an attempt was made to use a manuscript table computed many years ago at the Observatory, but it was found so full of small errors that this part of the table has been computed anew by Professor Frisby. We may take *cos n* positive, and N will have the same sign as the *cosine* of the hour angle, and *tang n* that of the *sine*.

The table for the factor k is from Bessel's *Astronomische Untersuchungen*, Bd. I, p. 198. This factor is of this form:

$$k = \alpha\, \beta^A\, \gamma^\lambda.$$

but generally in differential work we may take $k = \alpha$. This factor is expressed in seconds of arc.

t	*N*	cos *n*	tan *n*	*t*	*t*	*N*	cos *n*	tan *n*	*t*
h. m.	° ′			h. m.	h. m.	° ′			h. m.
0 0	51 6.3	0.00000	∞ neg.	12 0	0 46	50 32.2	9.99471	9.19610	11 14
0 1	6.3	0.00000	7.53097	11 59	0 47	30.7	9.99448	9.20554	11 13
0 2	6.3	9.99999	7.83200	11 58	0 48	29.1	9.99424	9.21479	11 12
0 3	6.2	9.99998	8.00910	11 57	0 49	27.6	9.99400	9.22386	11 11
0 4	6.1	9.99996	8.13304	11 56	0 50	26.0	9.99375	9.23274	11 10
0 5	6.0	9.99994	8.22996	11 55	0 51	24.3	9.99350	9.24145	11 9
0 6	5.8	9.99991	8.30916	11 54	0 52	22.6	9.99324	9.25000	11 8
0 7	5.6	9.99987	8.37613	11 53	0 53	20.9	9.99297	9.25839	11 7
0 8	5.3	9.99984	8.43413	11 52	0 54	19.1	9.99271	9.26662	11 6
0 9	5.0	9.99980	8.48530	11 51	0 55	17.3	9.99244	9.27471	11 5
0 10	4.7	9.99975	8.53108	11 50	0 56	15.5	9.99216	9.28266	11 4
0 11	4.4	9.99970	8.57250	11 49	0 57	13.7	9.99188	9.29048	11 3
0 12	4.0	9.99964	8.61031	11 48	0 58	11.8	9.99159	9.29816	11 2
0 13	3.6	9.99958	8.64500	11 47	0 59	9.9	9.99130	9.30571	11 1
0 14	3.2	9.99951	8.67732	11 46	1 0	7.9	9.99100	9.31314	11 0
0 15	2.8	9.99944	8.70731	11 45	1 1	5.9	9.99070	9.32045	10 59
0 16	2.3	9.99936	8.73538	11 44	1 2	3.9	9.99040	9.32765	10 58
0 17	1.7	9.99927	8.76174	11 43	1 3	50 1.8	9.99009	9.33474	10 57
0 18	1.2	9.99918	8.78660	11 42	1 4	49 59.7	9.98977	9.34172	10 56
0 19	51 0.6	9.99909	8.81013	11 41	1 5	57.6	9.99945	9.34859	10 55
0 20	50 59.9	9.99900	8.83245	11 40	1 6	55.4	9.98912	9.35537	10 54
0 21	59.3	9.99890	8.85368	11 39	1 7	53.2	9.98879	9.36205	10 53
0 22	58.6	9.99879	8.87394	11 38	1 8	51.0	9.98846	9.36863	10 52
0 23	57.9	9.99868	8.89329	11 37	1 9	48.7	9.98812	9.37512	10 51
0 24	57.1	9.99857	8.91183	11 36	1 10	46.4	9.98777	9.38152	10 50
0 25	56.3	9.99844	8.92961	11 35	1 11	44.0	9.98742	9.38784	10 49
0 26	55.5	9.99831	8.94670	11 34	1 12	41.6	9.98706	9.39407	10 48
0 27	54.6	9.99818	8.96315	11 33	1 13	39.2	9.98670	9.40022	10 47
0 28	53.8	9.99804	8.97901	11 32	1 14	36.8	9.98634	9.40629	10 46
0 29	52.9	9.99789	8.99432	11 31	1 15	34.3	9.98597	9.41228	10 45
0 30	51.9	9.99775	9.00910	11 30	1 16	31.7	9.98559	9.41820	10 44
0 31	50.9	9.99760	9.02341	11 29	1 17	29.2	9.98521	9.42404	10 43
0 32	49.9	9.99744	9.03727	11 28	1 18	26.6	9.98483	9.42981	10 42
0 33	48.8	9.99727	9.05071	11 27	1 19	23.9	9.98444	9.43552	10 41
0 34	47.7	9.99711	9.06374	11 26	1 20	21.2	9.98404	9.44116	10 40
0 35	46.6	9.99694	9.07641	11 25	1 21	18.5	9.98364	9.44673	10 39
0 36	45.5	9.99676	9.08872	11 24	1 22	15.8	9.98324	9.45224	10 38
0 37	44.3	9.99658	9.10071	11 23	1 23	13.0	9.98283	9.45768	10 37
0 38	43.1	9.99639	9.11236	11 22	1 24	10.1	9.98241	9.46306	10 36
0 39	41.9	9.99619	9.12374	11 21	1 25	7.2	9.98199	9.46838	10 35
0 40	40.6	9.99599	9.13482	11 20	1 26	4.3	9.98157	9.47365	10 34
0 41	39.3	9.99579	9.14564	11 19	1 27	49 1.4	9.98114	9.47886	10 33
0 42	37.9	9.99559	9.15620	11 18	1 28	48 58.4	9.98071	9.48402	10 32
0 43	36.5	9.99537	9.16652	11 17	1 29	55.4	9.98027	9.48912	10 31
0 44	35.1	9.99516	9.17659	11 16	1 30	52.4	9.97983	9.49416	10 30
0 45	33.7	9.99494	9.18645	11 15	1 31	49.3	9.97938	9.49916	10 29
0 46	50 32.2	9.99471	9.19610	11 14	1 32	48 46.1	9.97893	9.50410	10 28

For hour angles between 12^h and 24^h, add 12^h to the preceding argument. *N* has the sign of the cosine of the hour angle; tan *n* that of the sine.

t	*N*	cos *n*	tan *n*	*t*	*t*	*N*	cos *n*	tan *n*	*t*
h. m.	° ′			h. m.	h. m.	° ′			h. m.
1 32	48 46.1	9.97893	9.50410	10 28	2 18	45 36.7	9.95308	9.69120	9 42
1 33	42.9	9.97847	9.50899	10 27	2 19	31.5	9.95241	9.69461	9 41
1 34	39.7	9.97801	9.51384	10 26	2 20	26.3	9.95174	9.69800	9 40
1 35	36.5	9.97754	9.51864	10 25	2 21	21.0	9.95106	9.70137	9 39
1 36	33.2	9.97707	9.52340	10 24	2 22	15.7	9.95038	9.70472	9 38
1 37	29.9	9.97659	9.52811	10 23	2 23	10.3	9.94970	9.70805	9 37
1 38	26.5	9.97611	9.53277	10 22	2 24	45 4.9	9.94901	9.71136	9 36
1 39	23.1	9.97562	9.53739	10 21	2 25	44 59.4	9.94832	9.71465	9 35
1 40	19.6	9.97513	9.54197	10 20	2 26	53.9	9.94762	9.71792	9 34
1 41	16.1	9.97464	9.54651	10 19	2 27	48.3	9.94692	9.72117	9 33
1 42	12.6	9.97414	9.55100	10 18	2 28	42.7	9.94622	9.72440	9 32
1 43	9.0	9.97364	9.55545	10 17	2 29	37.0	9.94551	9.72761	9 31
1 44	5.4	9.97313	9.55987	10 16	2 30	31.3	9.94479	9.73080	9 30
1 45	48 1.7	9.97261	9.56425	10 15	2 31	25.5	9.94408	9.73398	9 29
1 46	47 58.0	9.97209	9.56859	10 14	2 32	19.7	9.94336	9.73714	9 28
1 47	54.3	9.97157	9.57289	10 13	2 33	13.8	9.94263	9.74028	9 27
1 48	50.5	9.97104	9.57716	10 12	2 34	7.8	9.94190	9.74340	9 26
1 49	46.7	9.97051	9.58139	10 11	2 35	44 1.8	9.94117	9.74650	9 25
1 50	42.8	9.96997	9.58558	10 10	2 36	43 45.8	9.94043	9.74959	9 24
1 51	38.9	9.96943	9.58974	10 9	2 37	49.7	9.93969	9.75266	9 23
1 52	35.0	9.96888	9.59388	10 8	2 38	43.5	9.93895	9.75571	9 22
1 53	31.0	9.96833	9.59798	10 7	2 39	37.3	9.93820	9.75875	9 21
1 54	26.9	9.96777	9.60204	10 6	2 40	31.1	9.93745	9.76177	9 20
1 55	22.8	9.96721	9.60607	10 5	2 41	24.8	9.93669	9.76477	9 19
1 56	18.7	9.96665	9.61007	10 4	2 42	18.4	9.93593	9.76776	9 18
1 57	14.6	9.96608	9.61404	10 3	2 43	12.0	9.93517	9.77073	9 17
1 58	10.4	9.96551	9.61798	10 2	2 44	43 5.5	9.93440	9.77369	9 16
1 59	6.1	9.96493	9.62189	10 1	2 45	42 59.0	9.93363	9.77663	9 15
2 0	47 1.8	9.96434	9.62578	10 0	2 46	52.4	9.93286	9.77956	9 14
2 1	46 57.5	9.96375	9.62963	9 59	2 47	45.7	9.93208	9.78247	9 13
2 2	53.1	9.96316	9.63346	9 58	2 48	39.0	9.93130	9.78536	9 12
2 3	48.7	9.96256	9.63726	9 57	2 49	32.3	9.93051	9.78824	9 11
2 4	44.2	9.96196	9.64103	9 56	2 50	25.5	9.92972	9.79111	9 10
2 5	39.7	9.96136	9.64477	9 55	2 51	18.6	9.92893	9.79396	9 9
2 6	35.1	9.96075	9.64849	9 54	2 52	11.7	9.92814	9.79680	9 8
2 7	30.5	9.96013	9.65218	9 53	2 53	42 4.7	9.92734	9.79962	9 7
2 8	25.8	9.95951	9.65585	9 52	2 54	41 57.6	9.92654	9.80243	9 6
2 9	21.1	9.95889	9.65949	9 51	2 55	50.5	9.92573	9.80522	9 5
2 10	16.4	9.95826	9.66311	9 50	2 56	43.3	9.92492	9.80800	9 4
2 11	11.6	9.95763	9.66670	9 49	2 57	36.1	9.92411	9.81077	9 3
2 12	6.7	9.95699	9.67027	9 48	2 58	28.8	9.92329	9.81352	9 2
2 13	46 1.8	9.95635	9.67382	9 47	2 59	21.5	9.92247	9.81626	9 1
2 14	45 56.8	9.95570	9.67734	9 46	3 0	14.1	9.92165	9.81898	9 0
2 15	51.9	9.95505	9.68084	9 45	3 1	41 6.6	9.92083	9.82169	8 59
2 16	46.9	9.95440	9.68432	9 44	3 2	40 59.1	9.92000	9.82439	8 58
2 17	41.8	9.95374	9.68777	9 43	3 3	51.5	9.91917	9.82708	8 57
2 18	45 36.7	9.95308	9.69120	9 42	3 4	40 43.9	9.91834	9.82975	8 56

For hour angles between 12ʰ and 24ʰ, add 12ʰ to the preceding argument. *N* has the sign of the cosine of the hour angle; tan *n* that of the sine.

t		*N*		cos *n*	tan *n*	*t*		*t*		*N*		cos *n*	tan *n*	*t*	
h.	m.	°	′			h.	m.	h.	m.	°	′			h.	m.
3	4	40	43.9	9.91834	9.82975	8	56	3	50	33	39.9	9.87760	9.93958	8	10
3	5		36.2	9.91750	9.83241	8	55	3	51		29.0	9.87669	9.94170	8	9
3	6		28.4	9.91666	9.83506	8	54	3	52		18.0	9.87577	9.94380	8	8
3	7		20.5	9.91582	9.83769	8	53	3	53	33	6.9	9.87486	9.94589	8	7
3	8		12.6	9.91497	9.84031	8	52	3	54	32	55.8	9.87394	9.94797	8	6
3	9	40	4.7	9.91412	9.84292	8	51	3	55		44.6	9.87303	9.95004	8	5
3	10	39	56.7	9.91327	9.84551	8	50	3	56		33.3	9.87212	9.95210	8	4
3	11		48.6	9.91242	9.84809	8	49	3	57		22.0	9.87120	9.95415	8	3
3	12		40.4	9.91156	9.85066	8	48	3	58	32	10.5	9.87029	9.95618	8	2
3	13		32.2	9.91070	9.85322	8	47	3	59	31	59.0	9.86938	9.95820	8	1
3	14		23.9	9.90984	9.85577	8	46	4	0		47.4	9.86847	9.96021	8	0
3	15		15.5	9.90898	9.85830	8	45	4	1		35.7	9.86756	9.96221	7	59
3	16	39	7.1	9.90811	9.86082	8	44	4	2		24.0	9.86665	9.96420	7	58
3	17	38	58.7	9.90724	9.86333	8	43	4	3		12.1	9.86574	9.96617	7	57
3	18		50.1	9.90637	9.86583	8	42	4	4	31	0.2	9.86483	9.96813	7	56
3	19		41.5	9.90550	9.86831	8	41	4	5	30	48.3	9.86393	9.97009	7	55
3	20		32.8	9.90462	9.87078	8	40	4	6		36.2	9.86302	9.97203	7	54
3	21		24.1	9.90374	9.87324	8	39	4	7		24.0	9.86212	9.97395	7	53
3	22		15.3	9.90286	9.87569	8	38	4	8	30	11.8	9.86121	9.97586	7	52
3	23	38	6.4	9.90198	9.87813	8	37	4	9	29	59.5	9.86031	9.97777	7	51
3	24	37	57.4	9.90110	9.88056	8	36	4	10		47.1	9.85941	9.97966	7	50
3	25		48.4	9.90021	9.88297	8	35	4	11		34.7	9.85852	9.98154	7	49
3	26		39.3	9.89932	9.88537	8	34	4	12		22.1	9.85762	9.98341	7	48
3	27		30.2	9.89843	9.88776	8	33	4	13	29	9.5	9.85673	9.98526	7	47
3	28		21.0	9.89754	9.89014	8	32	4	14	28	56.8	9.85584	9.98710	7	46
3	29		11.7	9.89665	9.89251	8	31	4	15		44.0	9.85495	9.98894	7	45
3	30	37	2.3	9.89575	9.89487	8	30	4	16		31.1	9.85406	9.99076	7	44
3	31	36	52.9	9.89485	9.89721	8	29	4	17		18.2	9.85318	9.99256	7	43
3	32		43.4	9.89395	9.89954	8	28	4	18	28	5.2	9.85229	9.99435	7	42
3	33		33.8	9.89305	9.90186	8	27	4	19	27	52.1	9.85141	9.99613	7	41
3	34		24.1	9.89215	9.90417	8	26	4	20		38.9	9.85054	9.99789	7	40
3	35		14.4	9.89125	9.90647	8	25	4	21		25.6	9.84966	9.99964	7	39
3	36	36	4.6	9.89035	9.90876	8	24	4	22	27	12.3	9.84879	0.00138	7	38
3	37	35	54.8	9.88944	9.91104	8	23	4	23	26	58.9	9.84793	0.00311	7	37
3	38		44.8	9.88854	9.91330	8	22	4	24		45.4	9.84706	0.00482	7	36
3	39		34.8	9.88763	9.91555	8	21	4	25		31.8	9.84620	0.00652	7	35
3	40		24.7	9.88672	9.91779	8	20	4	26		18.1	9.84534	0.00821	7	34
3	41		14.6	9.88581	9.92002	8	19	4	27	26	4.4	9.84449	0.00988	7	33
3	42	35	4.4	9.88490	9.92224	8	18	4	28	25	50.6	9.84364	0.01154	7	32
3	43	34	54.1	9.88399	9.92445	8	17	4	29		36.7	9.84279	0.01318	7	31
3	44		43.7	9.88308	9.92665	8	16	4	30		22.7	9.84195	0.01481	7	30
3	45		33.2	9.88217	9.92883	8	15	4	31	25	8.6	9.84111	0.01643	7	29
3	46		22.7	9.86126	9.93100	8	14	4	32	24	54.5	9.84028	0.01804	7	28
3	47		12.1	9.88034	9.93316	8	13	4	33		40.3	9.83945	0.01963	7	27
3	48	34	1.4	9.87943	9.93531	8	12	4	34		26.0	9.83863	0.02120	7	26
3	49	33	50.7	9.87852	9.98745	8	11	4	35	24	11.6	9.83780	0.02277	7	25
3	50	33	39.9	9.87760	9.93958	8	10	4	36	23	57.1	9.83699	0.02432	7	24

For hour angles between 12ʰ and 24ʰ, add 12ʰ to the preceding argument. *N* has the sign of the cosine of the hour angle; tan *n* that of the sine.

t	*N*	cos *n*	tan *n*	*t*	*t*	*N*	cos *n*	tan *n*	*t*
h. m.	° ′			h. m.	h. m.	° ′			h. m.
4 36	23 57.1	9.83699	0.02432	7 24	5 18	12 43.7	9.80869	0.07513	6 42
4 37	42.6	9.83618	0.02585	7 23	5 19	26.3	9.80820	0.07597	6 41
4 38	28.0	9.83537	0.02737	7 22	5 20	12 8.9	9.80772	0.07679	6 40
4 39	23 13.3	9.83457	0.02887	7 21	5 21	11 51.3	9.80724	0.07759	6 39
4 40	22 58.5	9.09377	0.03036	7 20	5 22	33.7	9.80678	0.07837	6 38
4 41	43.6	9.83298	0.03184	7 19	5 23	11 16.1	9.80633	0.07913	6 37
4 42	28.7	9.83220	0.03330	7 18	5 24	10 58.4	9.80590	0.07987	6 36
4 43	22 13.7	9.83142	0.03475	7 17	5 25	40.7	9.80547	0.08060	6 35
4 44	21 58.6	9.83065	0.03618	7 16	5 26	23.0	9.80505	0.08131	6 34
4 45	43.5	9.82987	0.03759	7 15	5 27	10 5.1	9.80464	0.08199	6 33
4 46	28.2	9.82911	0.03899	7 14	5 28	9 47.3	9.80425	0.08265	6 32
4 47	21 12.9	9.82836	0.04038	7 13	5 29	29.4	9.80387	0.08330	6 31
4 48	20 57.6	9.82761	0.04175	7 12	5 30	9 11.4	9.80349	0.08393	6 30
4 49	42.1	9.82687	0.04310	7 11	5 31	8 53.5	9.80313	0.08454	6 29
4 50	26.6	9.82613	0.04444	7 10	5 32	35.4	9.80278	0.08512	6 28
4 51	20 11.0	9.82540	0.04576	7 9	5 33	8 17.4	9.80244	0.08568	6 27
4 52	19 55.3	9.82468	0.04707	7 8	5 34	7 59.3	9.80212	0.08623	6 26
4 53	39.5	9.82396	0.04836	7 7	5 35	41.1	9.80180	0.08676	6 25
4 54	23.7	9.82325	0.04963	7 6	5 36	23.0	9.80150	0.08727	6 24
4 55	19 7.8	9.82255	0.05089	7 5	5 37	7 4.8	9.80120	0.08776	6 23
4 56	18 51.8	9.82186	0.05213	7 4	5 38	6 46.5	9.80092	0.08822	6 22
4 57	35.8	9.82117	0.05336	7 3	5 39	28.3	9.80066	0.08867	6 21
4 58	19.7	9.82049	0.05457	7 2	5 40	6 10.0	9.80040	0.08909	6 20
4 59	18 3.5	9.81982	0.05576	7 1	5 41	5 51.6	9.80016	0.08950	6 19
5 0	17 47.3	9.81915	0.05694	7 0	5 42	33.3	9.79993	0.08988	6 18
5 1	30.9	9.81850	0.05810	6 59	5 43	5 14.9	9.79971	0.09025	6 17
5 2	17 14.5	9.81785	0.05924	6 58	5 44	4 56.5	9.79950	0.09060	6 16
5 3	16 58.1	9.81721	0.06037	6 57	5 45	38.1	9.79930	0.09092	6 15
5 4	41.6	9.81658	0.06148	6 56	5 46	19.7	9.79912	0.09122	6 14
5 5	25.0	9.81596	0.06257	6 55	5 47	4 1.2	9.79895	0.09150	6 13
5 6	16 8.3	9.81534	0.06364	6 54	5 48	3 42.7	9.79879	0.09176	6 12
5 7	15 51.6	9.81474	0.06470	6 53	5 49	24.2	9.79865	0.09200	6 11
5 8	34.8	9.81414	0.06574	6 52	5 50	3 5.7	9.79852	0.09222	6 10
5 9	18.0	9.81355	0.06676	6 51	5 51	2 47.2	9.79840	0.09242	6 9
5 10	15 1.1	9.81297	0.06776	6 50	5 52	28.6	9.79829	0.09260	6 8
5 11	14 44.1	9.81240	0.06874	6 49	5 53	2 10.1	9.79819	0.09276	6 7
5 12	27.1	9.81184	0.06971	6 48	5 54	1 51.5	9.79811	0.09289	6 6
5 13	14 10.0	9.81129	0.07066	6 47	5 55	32.9	9.79804	0.09301	6 5
5 14	13 52.9	9.81075	0.07159	6 46	5 56	1 14.4	9.79798	0.09311	6 4
5 15	35.7	9.81022	0.07250	6 45	5 57	0 55.8	9.79794	0.09318	6 3
5 16	18.4	9.80970	0.07340	6 44	5 58	37.2	9.79791	0.09323	6 2
5 17	13 1.1	9.80919	0.07427	6 43	5 59	18.6	9.79789	0.09326	6 1
5 18	12 43.7	9.80869	0.07513	6 42	6 0	0 0.0	9.79788	0.09327	6 0

For hour angles between 12^{h} and 24^{b}, add 12^{h} to the preceding argument. *N* has the sign of the cosine of the hour angle; tan *n* that of the sine,

True Z. D.	Log a	A	λ	True Z. D.	Log a	A	λ
°				° ′			
0	1.76143	. .	. .	77 0	1.75005	0.9975	1.0197
10	.76141	. .	. .	10	.74976	.9974	.0202
20	.76135	. .	. .	20	.74945	.9973	.0208
30	.76122	. .	. .	30	.74914	.9972	.0213
35	.76112	. .	. .	40	.74882	.9971	.0219
40	.76099	. .	. .	50	.74848	.9970	.0226
45	.76080	. .	1.0013	78 0	.74813	.9970	.0234
46	.76075	. .	.0013	10	.74777	.9969	.0241
47	.76070	. .	.0014	20	.74740	.9968	.0249
48	.76065	. .	.0015	30	.74701	.9967	.0257
49	.76059	. .	.0015	40	.74660	.9967	.0265
50	.76053	. .	.0016	50	.74617	.9966	.0273
51	.76047	. .	.0017	79 0	.74573	.9965	.0281
52	.76040	. .	.0018	10	.74527	.9964	.0289
53	.76032	. .	.0019	20	.74478	.9963	.0296
54	.76024	. .	.0021	30	.74428	.9962	.0304
55	.76014	. .	.0024	40	.74376	.9961	.0312
56	.76004	. .	.0026	50	.74321	.9960	.0320
57	.75993	. .	.0028	80 0	.74263	.9958	.0329
58	.75981	. .	.0030	10	.74203	.9957	.0337
59	.75967	. .	.0032	20	.74141	.9955	.0346
60	.75953	. .	.0035	30	.74075	.9954	.0354
61	.75937	. .	.0038	40	.74005	.9952	.0363
62	.75919	. .	.0041	50	.73933	.9951	.0372
63	.75899	. .	.0044	81 0	.73857	.9949	.0382
64	.75877	. .	.0048	10	.73777	.9948	.0393
65	.75852	. .	.0052	20	.73692	.9946	.0404
66	.75824	. .	.0058	30	.73605	.9944	.0416
67	.75793	. .	.0064	40	.73514	.9942	.0429
68	.75757	. .	.0071	50	.73417	.9940	.0444
69	.75717	. .	.0079	82 0	.73314	.9938	.0459
70	.75670	. .	.0088	10	.73207	.9936	.0476
71	.75615	. .	.0099	20	.73095	.9934	.0493
72	.75552	. .	.0110	30	.72974	.9931	.0512
73	.75478	. .	.0123	40	.72846	.9929	.0531
74	.75390	. .	.0140	50	.72711	.9926	.0552
75 0	.75284	. .	.0155	83 0	.72569	.9924	.0573
10	.75265	. .	.0158	10	.72418	.9920	.0594
20	.75245	. .	.0161	20	.72256	.9917	.0617
30	.75225	. .	.0164	30	.72083	.9913	.0640
40	.75204	. .	.0167	40	.71902	.9909	.0664
50	.75182	. .	.0170	50	.71708	.9905	.0688
76 0	.75159	. .	.0173	84 0	.71499	.9901	.0715
10	.75136	. .	.0177	10	.71276	.9897	.0742
20	.75112	. .	.0180	20	.71037	.9893	.0771
30	.75087	. .	.0184	30	.70782	.9888	.0802
40	.75060	. .	.0188	40	.70509	.9882	.0834
50	.75033	. .	.0192	50	.70216	.9876	.0868
77 0	1.75005	0.9975	1.0197	85 0	1.69902	0.9870	1.0903

$$k = a\,\beta^{A}\,\gamma^{\lambda}.$$

The argument is the true zenith distance.

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